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PENNY CYCLOPÆDIA

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RICHARDSON, SAMUEL, the inventor of the modern English novel, was born in Derbyshire in 1689. His father had been a joiner in London, but had retired to the country, and fixed himself at Shrewsbury, after the execution of the duke of Monmouth, with whom it appears he had been in some way or other connected. It is stated that both his father and his mother had been born in a superior station to that in which they had come to move. At one time the joiner hoped to have been able to educate his son for the church; but a decline in his circumstances forced him to *forego* this ambition, and young Richardson was in his seventeenth year bound apprentice to Mr. John Wilde, a printer of London, after having had merely the education in reading and writing to be obtained at a common village school. He has informed us himself however, that long before this the peculiar talents which he afterwards displayed in his novels had begun to show themselves. He was noted while at school, he relates, for his flow of invention; his schoolfellows used to make him tell them stories, and were always most pleased with those he made out of his own head. 'All my stories,' he characteristically adds, 'carried with them, I am bold to say, a useful model.' But already, as throughout his life, his most delighted listeners, and the associates who best drew forth his powers, were of the other sex. 'As a bashful and not forward boy,' he says, 'I was an early favourite with all the young women of taste and reading in the neighbourhood Half-a-dozen of them, when met to work with their needles, used, when they got a book they liked, and thought I should, to borrow me to read to them, their mothers sometimes with them; and both mothers and daughters used to be pleased with the observations they put me upon making. I was *not* more than thirteen when three of these young women, unknown to each other, having a high opinion of my taciturnity, revealed to me their love secrets, in order to induce me to give them copies to write after, or correct, for answers to their lovers' letters; nor did any one of them ever know that I was the secretary to the others.' This was an employment well suited to nourish and strengthen Richardson's wonderful faculty of entering into the feelings of other hearts, and giving them true and natural expression.

He was so punctual and industrious during the seven years of his apprenticeship, that Wilde used to call him the pillar of his house; yet he did not neglect his private studies, finding time, by stealing it from the hours of rest and relaxation, both for much reading and a good deal of letter-writing. He remained five or six years as foreman in Mr. Wilde's printing-office after his apprenticeship expired, and then set up for himself in Salisbury-court, Fleet-street. Soon finding himself in possession of a good business, he married Miss Allington Wilde, his old master's daughter, whom however he lost in 1731, after she had borne him five sons and a daughter, all of whom he likewise survived. He afterwards married Miss Leake, sister of Mr. James Leake, bookseller, by whom he had five daughters and a son: of these, four daughters, with their mother, survived him.

Richardson first became an author in the year 1740. He had been in the habit of occasionally furnishing prefaces and dedications for the works which he printed, at the request of the publishers; and had been often importuned by his friends Mr. Rivington and Mr. Osborne to draw up for them a small collection of familiar letters on subjects of general interest in common life; a task, they conceived, well adapted to his style and turn of mind. Many years before, he had been greatly interested by a story of real life that had been told him, the same in its general outline with that of 'Pamela;' he now thought of making it the topic of a letter or two in the proposed little volume; but when he began to reflect on the subject, its capabilities gradually unfolded themselves to him, and 'I thought,' says he, 'the story, if written in an easy and natural manner suitable to the simplicity of it, might possibly introduce a new species of writing, that might possibly turn young people into a course of reading different from the pomp and parade of romance-writing, and, dismissing the improbable and marvellous, with which novels generally abound, might tend to promote the cause of religion and virtue.' The result was the composition of the first part of 'Pamela,' the two large volumes of which were written between the 10th of November, 1739, and the 10th of January, 1740. It was published in the latter year, and became immediately so popular that five editions of it were called for within the twelvemonth. So refreshing and exciting were mere nature, truth, and simplicity, even under many disadvantages and indeed positive offensivenesses of style and manner, found to be in a species of composition fitted above all others to amuse and interest the popular fancy, but which had hitherto been cultivated in our language only in a spirit and after a mode of working with which the taste of the most numerous class of readers was the least formed to sympathise.

The first part of 'Pamela' was soon followed by the second part, which was felt at the time by most people to be a great falling off, and which it has since been generally agreed is an attempt at improving the original story that might very well have been spared. The author was led to write it by the appearance of a sequel to his book by another hand, under the title of 'Pamela in High Life,' the wretched speculation of some needy scribbler to turn to his own profit the interest and curiosity which Richardson's work had excited. It ought to be mentioned that Richardson also completed and published the 'Collection of Familiar Letters' out of the project of which his novel had arisen: Mrs. Barbauld, his biographer, speaks of this performance in high terms, describing it as 'a work usually found in the servant's drawer, but which, when so found, has not unfrequently detained the eye of the mistress, wondering all the while by what secret charm she was induced to turn over a book apparently too low for her perusal.' Another incident connected with the publication of Richardson's first novel is the circumstance of its having been the means of impelling his celebrated contemporary Fielding into the same line of writing; Fielding's first novel, properly so called, his 'Joseph Andrews,' which appeared in 1742, was an avowed burlesque of 'Pamela,' for which Richardson never forgave him.

It was not till after an interval of several years that 'Pamela' was followed by 'The History of Clarissa Harlowe.' The first four volumes of this greatest beyond all dispute of Richardson's novels appeared in 1748 and immediately raised his reputation as a master of fictitious narrative to the highest point. The admiration it excited was not confined to his own country; the work, translated into the French and German languages, soon acquired for him a European name. So strong was the hold which the story took of the imaginations of its readers, that, asif the events and characters had all been real, and the author's pen had had a power of actual creation and embodiment, many persons, during the progress of the work, wrote to him in the most urgent terms to gratify them by such a winding up of the plot as they had set their hearts upon, declaring that their own happiness depended upon the extrication of the heroine from the miseries in which he had involved her. But Richardson obeyed his own high genius, and was not to be persuaded to turn the deep and noble tragedy of unconquerable and triumphant endurance which he had so finely conceived, into a mere common-place stimulant for sentimentalism.

Richardson's next and last great work, his 'History of Sir Charles Grandison,' appeared in 1753. This is of all his works that in which he has most frequently deserted the true field of his genius, and ventured farthest upon ground on which he was not qualified to appear with advantage; and accordingly it contains much more that is tedious and uninteresting than either of his other novels; the plot too has little that excites curiosity or sympathy; and the conception of the principal personage sins against all the principles both of poetical art and of probability and the philosophy of human nature. Yet with all its faults this novel too is full of its author's most graphic and dramatic genius; the whole picture of Clementina, in particular, is perhaps surpassed by nothing in either 'Pamela' or 'Clarissa.'

The only publications of Richardson's that have not been mentioned are, a paper in the 'Rambler' (No. 97); an edition of 'Æsop's Fables, with Reflections;' a single printed sheet, entitled 'The Duties of Wives to Husbands' (a subject on which, with all his amenity of nature, he entertained somewhat strong notions); and his 'Case,' a statement of the piracy of his 'Sir Charles Grandison' by the Dublin booksellers. His works brought him a considerable harvest of profit as well as of fame; and his pen and a flourishing business together soon placed him not only in easy, but even, it may be said, in affluent circumstances. He early obtained, through the interest of Mr. Speaker Onslow, the lucrative employment of printing the Journals of the House of Commons; and in 1760 he purchased the moiety of the patent of king's printer. In 1754 he was elected to the post of master of the Stationer's Company. He continued to reside and carry on his business to the last in Salisbury-court; but he had also his country villa, first at North End, afterwards at Parson's Green. He died on the 4th July, 1761, and was buried beside his first wife, in the middle aisle of St. Bride's church.

No character could be freer from vice of every sort, or more perfectly irreproachable, than that of Richardson. In all the duties of morality and piety he was the most regular and exemplary of men. His principal weakness was a rather greater than usual share of literary vanity, not untinctured with some disposition to underrate other writers of the day, more especially those who were fortunate enough to share the public favour with him in his own walk. These were failings naturally springing from the circumstances of his life, and the somewhat effeminate constitution of his nature both intellectual and moral; and they were further nourished by the habit of seclusion in a coterie of female idolaters—a sort of platonic harem—in which he indulged in his latter days.

RICHARDSO'NIA, the name of a genus of plants in the natural order Cinchonaceæ, given by Houston in honour of Richardson, an English botanist of the sixteenth century. This genus was called Richardia by Linnæus, but that name has been given to another plant. Most of the species of Richardsonia are natives of South America. They possess emetic properties, and under the name White Ipecacuanha, &c. are used extensively as a substitute for the true Ipecacuanha (*Cephælis Ipecacuanha*).

RICHBOROUGH. [Kent.]

RICHELIEU, ARMAND JEAN DU PLESSIS, CARDINAL DE, a younger son of François du Plessis, Lord of Richelieu, was born at Paris, in 1585. He studied at the college of Navarre, and was at first intended for the military profession, but his elder brother Alphonse, bishop of Luçon, having resolved to withdraw from active life and retire into a Carthusian convent, young Armand was looked upon as his successor in his see. Accordingly he applied himself to the study of divinity, in which he took a doctor's degree at the age of twenty. The pope objected to his being consecrated bishop of Luçon on account of his youth; but Armand repaired to Rome, and succeeded in convincing the pope of his aptitude for the episcopal office, and he was consecrated in 1607. Having taken possession of his see, he applied himself sedulously to the discharge of his pastoral duties, and in preaching and converting the Calvinists. In 1614 he sat as deputy of the clergy of Poitou in the assembly of the States-General, on which occasion he harangued the young king Louis XIII., and so pleased the queen-mother Marie de' Medici, that she made him her almoner, which was the beginning of his fortune. He was soon made secretary of state, but in consequence of a quarrel between the king and his mother, Richelieu was banished to his diocese. He afterwards acted as mediator between those two personages, and acquired a permanent influence over both. In 1622 he was made a cardinal, soon after which the queen-mother obtained for him a seat in the council in 1624, when he became the chief minister of the crown, and continued such for the remaining eighteen years of his life. The history of his political career forms an important period in the history of the French monarchy. Richelieu had three great objects in view: 1, to render the power of the crown absolute, and to humble the feudal nobility; 2, to annihilate the Calvinists as a political party; 3, to reduce the power of the house of Austria, both in its German and Spanish branches, and to extend that of France. Unscrupulous about the means, he succeeded in breaking down the political influence of the nobles, many of whom he sent to the scaffold on various pretences. He put to death Marshal de Marillac, the duke of Montmorency, Cinq Mars, and De Thou, and many more in a cruel manner. Others were shut up in dungeons during the cardinal's life. His great political opponent was Gaston d'Orléans, the king's brother, who conspired against the cardinal. The conspiracy failed, and was the cause of the death of Gaston's friends. Gaston then openly revolted against the king, being assisted by the duke of Lorraine, whose sister he had married. He was not more successful in this attempt, was obliged to seek an asylum in the Spanish Netherlands, and the duke of Lorraine lost his dominions, which were seized by the French. The queen-mother, who had quarrelled with the cardinal and supported his enemies, was obliged to quit France. She retired to Cologne, where she died, in 1642, in great distress.

Richelieu accomplished the second object which he had in view, namely, the extirpation of the Calvinist party, by besieging in person and taking La Rochelle, the stronghold of the Calvinists, in 1628. But the motives of Richelieu appear to have been more political than religious: at all events he did not show himself after his victory a fanatic or a persecutor. He secured religious tolerance to the Calvinists by a royal edict in 1629; and when the faculty of theology of Montauban, which was then, as it is now, the Calvinist university of France, went to visit the cardinal, he told them courteously that he could not receive them as a body of divines, but that he should always be willing to see them as men of learning.

The third great object of Richelieu was that of humbling the House of Austria, which, since the time of Charles V., had been the preponderating power in Europe. For this purpose, setting aside all clerical scruples, he supported, first secretly and afterwards openly, the Protestants of Germany against the emperor. His almoner, a Capuchin friar named Père Joseph, was his confident and trusty agent in all his diplomatic intrigues. The history of this singular character has been published, 'Histoire du véritable Père Joseph,' and is a most curious biography. The friar repaired to Germany, to the camp of the Protestant princes and of Gustavus, and also to that of Wallenstein. After the death of the two great leaders, Gustavus and Wallenstein, the French troops carried on the war on the Rhine in concert with the Swedes against the emperor. At the same time Richelieu was assisting the Protestant Grisons against the Roman Catholic insurgents of Valtelina, who were supported by the Spaniards. He also allied himself with the States-General of the Netherlands to attack the Spanish dominions in Belgium, which he had in view to annex to France as far as Antwerp, a scheme in which however he failed. On the side of Spain the French took Roussillon, and supported the Catalonians in their revolt against Philip IV. Richelieu is also said to have meddled, by means of Père Joseph and the French ambassador in London, in the first stirring of the Covenanters and Puritans which led to the great Revolution. Charles I., ever wavering in his foreign policy, had disappointed Richelieu in his proposal of a defensive league between France and England, and seemed to lean towards a Spanish alliance. 'The king and queen of England,' said Richelieu, 'will repent the rejection of the treaty before the year is over.' (Père Orléans; D'Estrade; President Hénault; *Biographie Universelle*, art. 'Richelieu.') In 1639 arms and ammunition were sent from France to Leith for the use of the disaffected.

In Italy the French invaded Piedmont, which however they evacuated by a treaty with the princes of Savoy. The principal result of all these wars was to circumscribe the imperial power in Germany, and to weaken the influence of Spain in the general politics of Europe.

In 1642 Richelieu fell ill, and died in December, at his house at Paris, at the age of fifty-eight. The king repaired to his bed-side shortly before his death, when the cardinal recommended to him Mazarin and others, and told his majesty that he left the kingdom at the highest pitch of glory, and protested to him that all his 'doings as a minister had been for the good of religion and of the state,' an assertion rather startling from such a man, but which he may very possibly have believed. His funeral was magnificent, but the people of Paris made bonfires in token of rejoicing. He had become unpopular of late years on account of the fresh burthens which he had laid on the people. A splendid mausoleum, by Girardon, was raised to his memory in the church of La Sorbonne. He left a considerable property, which however had not been altogether accumulated at the expense of the state, but was in great part the proceeds of his vast church preferment.

Mary de' Medici had died at Cologne a few months before Richelieu, and Louis XIII. died five months after his minister.

Richelieu established the royal printing-presses; he was the founder of the French Academy; he built the Palais Royal, which was then called Palais Cardinal, and he rebuilt La Sorbonne. He was well informed for his age, and has left several works, some on religious and controversial subjects, and others on politics. His 'Testament Politique' has been considered by some as apocryphal, but Foncemagne has defended its authenticity in the edition of 1764, by his Letters to Voltaire, and apparently upon sufficient grounds. The 'Mémoires du Cardinal de Richelieu,' written by himself, have been published in several volumes, in 1822-3, by Petitot, from a MS. corrected in the Cardinal's own hand, which existed in the archives of the department of Foreign Affairs at Paris. A Life of Richelieu, by Le Clerc, was published in two volumes, Cologne, 1696, without the author's name: it seems fairly written. Aubéry and others have also written biographies of Richelieu. His domain of Richelieu in Poitou was created a dukedom by Louis XIII., in 1631.

Cardinal Richelieu ranks among the greatest ministers of the old French monarchy; he had extended views, great perseverance and acuteness, and a lofty mind, but he was also revengeful, cruel, and unprincipled. He laboured strenuously to make the authority of the crown absolute, and by so doing he paved the way for the subsequent despotism of Louis XIV. Montesquieu says that Richelieu made his master the second man in the monarchy, but the first in Europe that he depressed the king, but ennobled his reign.'

His grand-nephew, Louis François du Plessis de Richelieu, marshal of France, figured under Louis XV., and acquired a name for his bravery in war and some ability in negotiation, and also for his libertinism, court intrigue, and overbearing disposition. He died in 1788, at a very advanced age. A grandson of marshal Richelieu entered the Russian service during the French revolution, was made governor of Odessa, a town which he greatly improved, and became, after the Restoration, minister of Louis XVIII. He was known by the title of duc de Richelieu. He died in 1821, with the reputation of an honourable and loyal statesman.

RICHMOND, an antient borough, a market-town, and parish, and the capital of the extensive baronial liberty of Richmondshire, in West Gilling wapentake, the most north-western division of the North Riding of Yorkshire. The whole wapentake is in the liberty of Richmondshire, in the archdeaconry and deanery of Richmond, and in the diocese of Ripon. Richmond is 239 miles north-north-west of London, 44 miles north-west of York, and 52 miles north by west of Leeds. The municipal borough comprises only the parish of Richmond, and the corporate body consists of a mayor, four aldermen, and twelve councillors, with a commission of the peace of six magistrates besides the mayor and recorder. Richmond was deprived of its quarter-sessions by the Municipal Act, but they have since been restored. The parliamentary borough comprises the parishes of Richmond and Easby, and extends over 10,000 acres of land, and has a population of 4722. The population of Richmond alone, in 1831, was 3900. This borough returns two members to parlament, and is one of the polling-places for the North Riding.

Alan Rufus, son of Hoel, count of Bretagne, a kinsman of William the Conqueror, who accompanied him in his expedition to England, is generally stated to have been the founder of both the castle and town of Richmond. By some authorities the town is said to have been in existence prior to the Conquest. William conferred on Alan the title of earl of Richmond, and the estates of the Saxon earl Edwin, embracing nearly 200 manors and townships, and a jurisdiction over all Richmondshire, about a third of the North Riding. In the situation of his castle Earl Alan selected not only an eligible residence, but also a place of defence; its foundation was laid on an almost perpendicular rock on the left bank of the Swale, about a hundred feet above the bed of the river. The site contains about six acres, and commands an extensive view of the surrounding country. To the original buildings of the castle, additional walls, towers, and outworks were erected by the successors of the founder. The earls of Richmond enjoyed these possessions till they fell to the crown on Henry, earl of Richmond, becoming king of England by the title of Henry VII. Charles II. bestowed the title of duke of Richmond on his son Charles Lenox, in whose descendants the dignity continues. The walks round the castle present a succession of varied and romantic scenery. Swaledale is in many parts skirted with with bold rocks almost covered with trees and shrubs. From the hills on the north-west side of the town, the castle and town seem to be situated in a valley. The ruins of the castle are still majestic. The bold Norman keep is almost entire; the walls are nearly one hundred feet high and eleven feet thick. It is the property of the duke of Richmond. The dilapidations seem to be solely owing to the neglect of repairs.

A small monastery, called the Grey Friary, was founded at Richmond in 1258, the sole remains of which are a steeple, which Rickman describes as 'a remarkably elegant specimen of good perpendicular work.' The extensive remains of St. Agatha's Abbey are about a mile below Richmond: many of the arches and columns of the finely pointed windows and doors are in good preservation. These ruins are in the parish of Easby, and are surrounded by well-wooded grounds and fine scenery.

Richmond is said to have been a place of good trade for three centuries after the Conquest, but many causes contributed to its decay; among these may be mentioned the charters granted for holding markets in neighbouring towns, and the want of water-communication, which is precluded by the rocky bed of the Swale and the sudden swells to which the river is subject. The market of Richmond is held on the Saturday, and it is well supplied with corn and other provisions. Many wealthy people reside in the town, and the country for several miles round is studded with the parks and mansions of numerous landed proprietors. The races are well attended, and are held in the first week of September, on the high moor about a mile from the town, where there is a commodious grand stand. Several of the resident gentry have training-stables near the race-ground. Three fairs are held at Richmond in the course of the year.

The chief manufactory is an extensive paper-mill. Gas-works were established in 1821, and waterworks in 1837. The town-hall is a convenient building, in which the public business of the town is transacted and the quarter-sessions held both for the town and Riding. It contains a spacious assembly room.

A court of record is held once a fortnight before the mayor, recorder, and aldermen; it takes cognizance of all pleas, actions, and suits in which the debts or damages do not amount to more than 100*l.*; the recorder is the sole judge in this court. A court baron for the liberty of Richmondshire, of which the duke of Leeds is the chief bailiff, is held once in three weeks for the recovery of debts under forty shillings.

The parish church is a Gothic building, and consists of a nave, chancel, and aisles, with a tower at the west end. It has been enlarged several times, and exhibits several varieties of architecture. The rectory is in the patronage of the crown. Holy Trinity chapel stands in the market-place. The consistory court for the archdeaconry of Richmond is held in two rooms adjoining the north aisle. Some portions of this building are occupied as shops and dwellings. The upper part of the north aisle is fitted up for divine service. The other places of worship are a Catholic chapel, erected by Sir John Lawson, Bart., in 1811; an Independent chapel; and a Wesleyan chapel.

Richmond free grammar-school was founded and endowed by the burgesses, and incorporated by Queen Elizabeth, by which Act it was called 'The free grammar-school of the burgesses of the borough or town of Richmond, in the county of York, for the education and instruction of boys and youths in grammar.' The four bailiffs were to be the governors of the possessions of the school. The property now produces a yearly income of 337*l.* 7*s.* 4*d.* All natives and the sons of burgesses and other persons residing within the borough are entitled to admission as free scholars by the payment of seven shillings a year for fire, candles, and cleaning. The instruction in writing and arithmetic is also paid for.

The Corporation School is endowed with an annuity of 50*l.* from the borough funds and charities, for which fifty scholars are taught. The National School contains about one hundred boys and eighty girls. There are also an infant-school, a mechanics' library, a subscription library, and a news-room.

There are charities at Richmond for poor tradesmen and widows, for the distribution of coals, bread, and medicines, and various small bequests for education and apprentice fees. (Clarkson's *Richmond*; and Allen's *Yorkshire.*)

RICHMOND. [SURREY.]

RICHMOND. [VIRGINIA.]

RICHTER, JEAN PAUL FRIEDRICH, commonly called Jean Paul, was born on the 21st of March, 1763, at Wunsiedel, in the neighbourhood of Baireuth, where his father held the office of tertius or under-schoolmaster and organist. Shortly after the birth of his son, he was made pastor of the village of Jodiz, whence he was transferred to Schwarzenbach on the Saale. Owing to the very limited circumstances of his parents, as well as to the want of a good schoolmaster, the boy had hitherto been educated and taught at home by his father. At Schwarzenbach however he was sent to school, and continued the study of Latin and Greek, to which Hebrew and some other branches of learning were added. His stay at this school was short, and he was sent to the gymnasium at Hof, where he continued his studies for two years, notwithstanding the death of his father, which happened shortly after his arrival there, and left his family almost in a state of destitution. The young scholar however was in some degree supported by his grandfather on his mother's side. In 1781 he went to the university of Leipzig, for his family wished that he should follow the example of his father and study theology. He hoped to obtain some support from the university, but he found the difficulties greater than he had anticipated; and he was thrown entirely on his own resources. He had to contend with extreme want, and was sometimes even unable to obtain necessary food and clothing. The circumstances of his mother likewise grew worse, and she was unable to supply him with any money. Notwithstanding this painful situation, he persevered in his studies, and he remained cheerful. Soon after his arrival at Leipzig he had given up the study of theology, which he found ill-suited to his taste, and now seeing no other possibility of satisfying his most urgent wants, he wrote a book called 'Grönländische Processe,' 2 vols., Berlin, 1783. The pittance which he received for his work, small as it was, determined him henceforth to try to support himself by writing. A second book, 'Auswahl aus des Teufels Papieren,' was soon written, but no publisher could be found, as his first work had not met with a favourable reception. After many disappointments, he quitted Leipzig in 1785, and went to Hof to reside with his mother, who with her family inhabited a house containing one apartment. All that he possessed was a number of MSS. containing extracts from the various works which he had read. At Hof his poverty rather increased than diminished, but the unconquerable vigour of his mind and the benevolence of a few friends kept him up. He engaged himself as a tutor in a family, and in 1788 he succeeded in finding a publisher for his 'Auswahl aus des Teufels Papieren.' The little income which he thus gained was however not sufficient to support him and his family. In 1793 several families of Schwarzenbach united to invite him to come and undertake the education of their children, an offer which he gladly accepted. Here he tried and developed the principles of education which he afterwards (1807) published in his 'Levana.' His circumstances now began to improve, especially after 1793, when, through the mediation of a friend, he found a publisher for a new work called 'Die Unsichtbare Loge,' 2 vols., Berlin. This work attracted the attention of the public and brought the author into notice. A fair prospect of success as a writer being thus opened to him, he left Schwarzenbach (1794) and returned to Hof, where in the course of a few years he wrote some of his most admired works: 'Hesperus,' 4 vols., Berlin, 1794; 'Quintus Fixlein,' Baireuth, 1796 (this work was the first which appeared under his full name, for in the preceding ones he had only called himself Jean Paul); 'Biographische Belustigungen unter der Gehirnschale einer Riesin,' Berlin, 1796; 'Siebenkäs, oder Blumen-Frucht-und Dornenstücken,' &c., 4 vols., Berlin, 1796-97, and 'Der Jubelsenoir,' ibid., 1797. In this year his mother died, after having for a short time enjoyed the happiness of seeing her son appreciated, and Jean Paul now returned to Leipzig. His name was now favourably known, and the most distinguished among his countrymen, such as Gleim, Herder, Schiller, Wieland, and others, esteemed the man no less than his works. In 1798, in which year his work called 'Das Campanerthal, oder die Unsterblichkeit der Seele,' was published at Erfurt, he was induced by Herder, whom he revered more than any other of his friends, to take up his abode at Weimar. It was about this time that he become acquainted with the Duke of Saxe-Hildburghausen, who afterwards honoured him with the title of councillor of Legation (Legationsrath). In 1801 he married Charlotte Maier, the daughter of a distinguished physician of Berlin. He first settled at Meiningen, which in 1803 he exchanged for Coburg; but after a short stay in this town he took up his permanent residence at Baireuth. During this period of wandering he wrote 'Briefe und Bevorstehender Lebenslauf,' Gera, 1799; 'Titan,' 4 vols., Berlin, 1800-3; 'Die Flegeljahre,' 4 vols., Tübingen, 1804-5.

At Baireuth he enjoyed the well deserved fruits of his indefatigable zeal—the esteem and admiration of the most illustrious and best among his countrymen. In 1809 the Prince Primate, Carl von Dalberg, granted him a pension of 1000 florins per annum. In 1815 the prince was obliged to resign his secular sovereignty of Regensburg, Aschaffenburg, Frankfurt, Witzlar, &c., which he had before possessed, together with his archbishopric and primacy of Regensburg, but the pension was continued by Maximilian, king of Bavaria. In 1817 the university of Heidelberg honoured Jean Paul with the diploma of doctor of philosophy, and three years afterwards he was elected an ordinary member of the Academy of Sciences of Munich. From the time of his settlement at Baireuth, Jean Paul pursued his literary occupations as zealously as ever, and only now and then made either little excursions into the neighbouring country, or short journeys to Heidelberg, Munich, Berlin, and Dresden. Among the works which belong to this last and happiest period of his life, we shall only mention 'Vorschule der Aesthetik,' 3 vols., Hamburg, 1804; 'Katzenbergers Badereise,' 2 vols., Heidelberg, 1809; 'Des Feldprediger Schmelzle Reise nach Flätz,' Tübingen, 1809; 'Der Komet, oder Nicolaus Markgraf,' 3 vols., Berlin, 1820-22.

During the last years of his life he was attacked by a complaint in the eyes, which at the beginning of the year 1825 terminated in complete blindness. His physical powers also began to decline, and he died on the 14th of November, 1825. Some time before his death he had made preparations for a complete edition of his works. This plan was executed by his friend Dr. Otto, who edited the works of Jean Paul in 60 small 8vo. volumes, Berlin, 1826-28. Another edition in 4 vols., imp. 8vo., appeared at Paris, 1836-38, which is disfigured by numerous typographical errors.

Whether we consider Jean Paul as a man or as an author, he is one of the most wonderful phenomena that Germany has ever produced. He was simple-hearted as a child, and his kindness, benevolence, and purity of conduct were unparalleled; yet with all this he had courage enough to struggle fearlessly with a world of adversity, without losing one particle of his cheerful and humorous temper. His works, which are all written in prose, and most of which may be called humorous novels, evince the deepest and most intense feeling, a most profound knowledge of human nature, and an intimate acquaintance with almost every department of science. His earliest writings are sometimes of a satirical nature, and show that he had not yet reached the height of pure humour which appears in his later works. Some of his works, such as the 'Levana' and 'Vorschule der Aesthetik,' are not novels, but philosophical discussions full of profound thought; but even here his humour sometimes gushes forth and enlivens the abstruseness of philosophical inquiry. Notwithstanding these great qualities of Jean Paul, there are some circumstances which prevent his writings from being as popular as they deserve to be. His ideas and conceptions are too profound to be understood and appreciated by the many, and his thoughts are expressed in a language which presents considerable difficulties even to a German. His sudden transitions, his associations of ideas, the frequent distortions of his sentences, in which parenthesis is put into parenthesis, cause such difficulties to the ordinary reader, as will at first deter him from undertaking the task of searching for the sterling matter which is concealed under such a disguise. Jean Paul moreover possessed an inexhaustible stock of knowledge on all subjects, and his works abound in allusions which can only be understood by those who have made such subjects their study. The number of those who fully appreciate the merits of Jean Paul is, even in Germany, comparatively few; but these few are the best and most enlightened of the nation, and the power which his works exercise over them is greater than that of any other writer. The time when Jean Paul shall be fully appreciated is yet to come. The best key to his writings is a work called 'Wahrheit aus Jean Paul's Leben,' in 8 vols., Breslau, 1826-33, which was commenced by Jean Paul himself, and after his death continued and completed by Dr. Otto. Another very useful work in this respect is, R. O. Spazier, 'Jean Paul Friedrich Richter, ein biographischer Commentar zu seinen Werken,' 5 vols., Leipzig, 1833; H. Döring's 'Leben und Characteristik Richters,' in 2 vols., Gotha, 1826, is a very indifferent work.

English translations of some of the smaller and extracts from the larger works of Jean Paul have appeared in various magazines. But the choicest specimens, which are also most faithfully translated—are those given in *German Romance*, by T. Carlyle, who has also written some excellent essays on the life and writings of Jean Paul. (See Carlyle's *Miscellanies*, vol. i., p. 1-31; vol. ii., p. 295-377; comp. p. 403, &c.)

RICI'NULA. [Entomostomata, vol. ix., p. 457.]

RI'CINUS, the name of an apetalous genus of plants belonging to the natural order Euphorbiaceæ. This word is derived from *ricinus*, the Latin name for a species of insect which the fruit of this plant was supposed to resemble. (Plin., *Nat. Hist.*, xv. 7.) The common name of *Ricinus* is *Palma Christi*, a name applied to these plants by Brunfels, Matthiolus, and other older botanists, on account of the form of its elegant lobate leaves. It was originally a native of Asia, but is now naturalized in Africa, America, and the south of Europe. The characters of this genus are:—Flowers monœcious; calyx 3-5-parted, valvate; no petals; filaments numerous, polyadelphous; style short; stigmas three, bipartite, feathery; ovary globose, three-celled, with an ovule in each cell; fruit capsular, tricoccous; leaves alternate, stipulate, palmate, glands at apex of petiole; flowers in terminal panicles; trees, shrubs, or herbs, becoming arborescent. Of this genus the *Ricinus communis*, common Palma Christi, is best known as producing the castor-oil. It has peltate palmate leaves, with lanceolated serrated lobes; an herbaceous glaucous stem, of a purplish-red colour upwards, and flowers in long green and glaucous spikes springing from the divisions of the branches, the males from the lower part of the spike, the females from the upper. The capsules are prickly. It varies in size; in Britain it is seen seldom more than three or four feet in height, but in India it is a tree; and Clusius mentions it as measuring from two to four feet round its stem in Spain. Lindley refers several species distinguished by Willdenow to this form, viz. *R. viridis*, *R. africanus*, *R. lividus*, and *R. inermis*. (*Flora Medica*, p. 183.)

R. communis will grow freely in this country, and when sown in pots or hotbeds early in the season, and transplanted in spring, it forms a very handsome border annual.

RI'CINUS COMMU'NIS, the castor-oil plant, known from very antient times both to the Egyptians and also to the Greeks. According to Herodotus (ii. 94), the Egyptians called the oil of the *sillicyprion* (σιλλικύπριον) by the name *Kiki* (κίκι). The Greeks also called it *Croton* (κρότων), a name bestowed by modern botanists on a closely allied genus of euphorbiaceous plants, one species of which yields the purgative oil designated Croton oil, or Oleum Tiglii. [Croton.] The native country of the Ricinus communis is unknown, though it is conjectured to be originally from Barbary. Like all plants which have been long in cultivation, numerous varieties of it are met with, differing not only in colour and the peculiar pruinose condition of the stem, but in stature and duration. In warm countries it is ligneous and perennial; in cold, annual and herbaceous. The entire plant is possessed of active properties, but the oil extracted from the seeds is only employed in Europe: the antients administered the seeds entire, but their variable action, occasionally even producing fatal effects, led to their disuse, and the oil is of comparatively recent introduction. The seeds, of which three are found in each capsule, are about the size of a small bean, obtuse at both ends, surface smooth, shining, and beautifully marbled. They were formerly known in the shops as *semina Ricini*, or *Cataputiae majoris*. The skin consists of three tunics—1st, an outer brittle pellicle; 2nd, a hard testa consisting of two dissimilar layers, the external thick, dark brown, formed of transverse radiating cells; the internal thinner, paler, and formed of vertical cells; 3rd, a membrane investing the nucleus or kernel. 'The nucleus consists of oily albumen, and an embryo, the cotyledons of which are membranous or foliaceous.' The outer shell is devoid of taste; in the inner coat the acrimony or active principle resides, according to Dierbach; while others assert the embryo to be the seat of the purgative principle; and even Humboldt and Bancroft state that if this part be excised, the seeds may be eaten with impunity, or the oil thereafter expressed is as mild as olive-oil. The same statement has been made respecting the Jatropha Curcas, or *purging-nut* of the Philippine Islands. (See Bennet, in *Medical Gazette*, vol. ix., p. 7.) But this is by no means the case, as has been proved by Merat and De Lens (*Dictionnaire des Sciences Medicales*, t. xlix.) and Bennet (*l. c.*); who have shown that the active principle is diffused through the entire substance of the kernel, though it probably exists in greater intensity in the embryo. Various procedures have been adopted to extract the oil, and these have much influence on its qualities in respect of colour, acridity, and freedom from rancidity: there are also effects which result from the greater or less maturity of the seeds, the peculiar variety of the plant from which they have been obtained, and the occasionally accidental, but more frequently intentional admixture of other seeds, before the different processes of extraction have been begun. Both in India and America, whence the first supplies were brought, much heat was employed, and during the application of this agent a volatile principle was either liberated, or more probably formed, which was so irritating as to require the workmen to protect their faces by masks. Even in the present day some heat is used to obtain what is termed the *cold drawn* castor-oil, but it is quite unnecessary, and should always be avoided.

According to Sir Whitelaw Ainslie (*Materia Indica*, vol i., p. 256), the following is the plan pursued in the East Indies:—'Take five seers of the small castor-oil nuts, and soak them for one night in cold water; next morning strain this water off and throw it away, and put the nuts into a second quantity of fresh water, and boil them in it for two hours; after which strain the water off and throw it away, as in the first instance: the nuts then are to be dried in the sun on a mat for three days; at the end of which time they are to be well bruised in a mortar: add to the nuts thus bruised ten measures of water, and set the whole on the fire to boil, taking care to keep continually stirring the contents of the pot until all the oil appears at the top, when it is to be carefully strained off and bottled for use. The quantity of nuts mentioned in this formula ought to yield about one quart bottle of oil.' The processes used in the United States and the West Indies are both objectionable, from employing not only heat but water, which last promotes the rancidity of the oil. The acrid property and the rancidity are owing to different causes, the former being always in proportion to the freshness of the oil, the latter to the imperfection of the means used in extracting it, or to its age. The plan adopted in France is the best; it is as follows:—The fresh seeds are bruised, and then put into a cold press (some persons improperly heat the plates of the press). The oil expressed is allowed to stand some time to permit the albumen, mucilage, and other matters to subside, or it is filtered to separate them more rapidly. (*Journal de Pharmacie*, tom. v., pp. 207, 506.) The produce is equal to about a third of the seeds employed, and the oil possesses all its natural qualities. The American process yields only 25 per cent. of oil. In the French West Indian Islands, a peculiar variety of Ricinus, called *R. ruber*, more active, is used, which yields an oil called *carapa*, or *karahat*, but this is violent and unpleasant, and must not be confounded with or substituted for the fine oil procured in France. Both the French and Italian oils are much weaker than oil procured from tropical countries. Another mode of obtaining the oil is to macerate the bruised seeds in cold alcohol, by which six ounces of oil are procured from every pound of seeds. (*Journal de Pharmacie*, viii., 475.) The expense of this process is the objection to its general employment.

Oil of good quality is a thickish fluid, of a very pale yellow colour (the best now almost limpid), with a slightly nauseous odour, and an oily taste, mild at first, but causing a feeling in the back of the throat which is more or less intense in proportion to the freshness of the specimen. Old or badly prepared oil is rancid and disagreeable. The specific gravity is, at 55° Fahr., 0·969, according to Saussure, but according to Geiger it is only 0·954.

It can be solidified only by a very low temperature. It is distinguished among fixed oils by its complete or nearly complete solubility in pure sulphuric æther and in alcohol, thereby approaching the essential oils in its habitudes, and its easy combination with alkaline leys, and consequently its ready saponification, two properties of much importance, the one furnishing a convenient test of its purity, the other facilitating its administration in a form less repulsive than its ordinary state. Its very moderate price (in the year ending 5th of January, 1841, it ranged, according to quality, from 4*d*. to 10*d*. per lb.) renders it scarcely worth adulterating, but its purity may be tested by mixing it with an equal quantity of absolute alcohol, in which it should be entirely dissolved; the adulterating oil, if there be any, will remain undissolved. Its ultimate composition seems to be—

	Saussure.	Ure.
Carbon .	74·178	74·00
Hydrogen .	11·034	10·29
Oxygen .	14·788	15·71
	100·000	100·00

It thus appears to be one of the most highly oxygenated oils or fats, notwithstanding which, on exposure to the air, it very readily absorbs more oxygen, and quickly becomes rancid; it is however slow of drying. It is stated to consist of several proximate principles, but whether these are educts or products is uncertain. Bussy and Lecanu, who have paid great attention to the subject (*Journal de Pharmacie*, xiii. 57) incline to the latter opinion, which is the most probable. 'This oil,' they state, 'cannot be regarded as a simple immediate principle, but as a *compound organic product* resulting from the mixture of at least two different substances.' The other view is that it is a compound of *three fatty acids saturated by glycerin*, for in the process of saponification 100 parts of castor-oil yielded—

1. Fatty acids (viz. ricinic, elaïodic, and margaritic acids) . .	94	
2. Glycerin . . .	8	
		102

The only analysis of the seeds is that of Geiger (*Handbuch der Pharmacie*, ii., p. 1671):

a. Seed-coats	Tasteless resin and extractive .	1·91	23·82
	Brown gum .	1·91	
	Ligneous fibre .	20·00	
b. Nucleus of the seeds	Fatty oil .	46·19	69·09
	Gum . .	2·40	
	Caseum (albumen)	0·50	
	Ligneous fibre, with starch, &c. .	20·00	
Loss (moisture) . . .			7·09
			100·00

For further details respecting the chemistry of castor-oil, see Pereira's *Mat. Med.*, ii., p. 770.

Castor-oil is a mild aperient or laxative when pure, operating without griping or other inconvenience, and commonly very soon after its administration. It is the most proper laxative for infants, and in many inflammatory states of the abdomen or of the kidneys, bladder, &c. It is also one of the best purgatives in rheumatism, especially in lumbago, and one of the best means of relieving habitual constipation, as, unlike other purgatives, the dose may be successively reduced without its power being impaired. It is also a most eligible medicine in piles or other affections of the rectum. Alone or with turpentine it is a very efficacious means of expelling worms. The chief obstacle to its extensive use is the repulsive taste which it often possesses. Many expedients have been adopted to remove or lessen this; but no artifice can make bad or old oil good or palatable. Rancid oil may be purified by calcined magnesia; but the careful exclusion of the air, which prevents the rancidity occurring, is preferable to any process for removing it when it has affected the oil. Mixing the oil, immediately before swallowing it, with milk, coffee, or broth, is sometimes a successful means of escaping the unpleasantness. Brandy and gin are improper in many cases, owing to their heating properties. Syrup of orange and lemon are beneficial adjuncts, especially if a portion of the orange-peel be masticated immediately after swallowing the mixture. An emulsion with yolk of egg is sometimes acceptable, if made immediately before it is administered. By far the best plan however is to take advantage of the tendency to combine with alkalis, and so form a soapy emulsion, which does not destroy the purgative power, while it completely alters the appearance, and prevents any one recognising the oily object of his aversion. To effect this however requires care and skill, especially as a variable quantity of alkaline ley is needed, according to the age of the oil, very old oil requiring more ley than fresh oil. In general from fifteen to twenty drops of pure liquor potassæ will saponify half an ounce of oil, to which one ounce of distilled water, and one drachm of spirit of pimento or of nutmeg are to be added.

1. Quantity of castor-oil on which duty was paid for home consumption in the United Kingdom, showing the average annual consumption in each of the following periods of five years each, with the net revenue annually received in each period:—

Periods of Five Years.	Average Annual Home Consumption.	Average Annual Net Revenue.
1820-4	170,820 lbs.	£10,655
1825-9	281,661	7,678
1830-4	409,541	2,425
1835-9	708,005	535

2. Rates of duty:—

	British Possessions.			East India Company's Territories.			Foreign Countries		
	s.	d.		s.	d		s.	d.	
1820-4	1	3	per lb.	1	3	per lb.	1	3	per lb.
1825	0	6	..	0	9	..	1	0	..
1828	0	3	..	0	3	..	1	0	..
1833	2	6	per cwt.	2	6	per cwt.	1	0	..
1836 (Aug.)	1	3	..	1	3	..	1	3	per cwt.

The distinction formerly made in the rate of duty between castor-oil from British possessions and foreign countries was quite unnecessary, as nine-tenths of the quantity on which duty is paid comes from countries within the limits of the East India Company's territories, and nearly the whole of the remaining tenth is from the British West Indies. About one-fourth of the quantity imported is re-exported. In 1837-8-9 the importations averaged annually 905,726 lbs., and the home consumption 686,755 lbs.

Castor-oil is extensively used in the East, France, Italy, and elsewhere, for burning.

RICKETS, or Rachitis (from ῥάχις, the spine), is a disease in which the bones being of unnatural softness, some of them bend under the weight of the superincumbent parts of the body. Bones affected with rickets present such a softness of texture that they may be cut with a knife; their walls are remarkably thin, and their interior, instead of being filled with marrow deposited in their bony cells, is occupied by a semi-fluid jelly-like substance of a reddish colour, which fills a number of rounded cavities of irregular size. The quantity of earthy matter in such bones is reduced to considerably less than its natural proportion, and they lose much of their normal weight. All the bones may be thus affected, but it is only those which have to bear the weight of the body that give evidence of it by bending; the arms, for example, never change their form, but the thighs and legs become arched forwards under the weight of the trunk; the spine assumes a variety of curves from the pressure of the head; the breast-bone becomes prominent, and the ribs flattened; the haunch-bones grow outwards, and the pelvis is sometimes seriously deformed by an approximation of its anterior and posterior boundaries.

Rickets, as far as the softness of the bones is concerned, cannot be regarded as a dangerous disease; for this condition is generally recovered from, though not without deformity of the trunk and lower limbs. But the disease of the bones is commonly only a part of a general state of disease affecting many other organs of the body. The muscles are always pale and weak, and there are all the signs of general debility; and besides these, the brain and the organs contained in the chest and abdomen are peculiarly apt to suffer, and become the seat of fatal diseases, such as hydrocephalus, phthisis, obstruction of the mesenteric glands, &c. In all these respects there is much resemblance between rickets and scrofula; each may be regarded rather as a general disease than as a disorder of any particular organ or system of organs. The similarity extends to the remedies beneficial to each, which consist mainly of such means as will best amend the original weakness of the constitution, including a good and carefully regulated diet, pure air, warm clothing, bathing, and as much of active exercise as can be borne without fatigue. To these it is not essential in all cases that medicines should be added: where any are necessary, they are usually mild aperients and tonics, especially those of the latter class which contain iron.

When rickets affects only or chiefly the bones, an attention to the means just mentioned will, with advancing age, usually lead to a termination of the disease. The bones will gradually become hard by the addition of their natural quantity of earthy matter. They retain indeed the curves which they acquired in their condition of softness, but the want of strength which might result from this change of form is compensated by the remarkable thickness and strength which they acquire in the concavities of the curves, upon which the chief stress from the weight of the body falls.

Young persons are exclusively subject to rickets. It occurs at the age of two or three years, and from that time to puberty, and as the curvatures begin to form as soon as the weight of the body is thrown on the limbs by assuming the erect posture, it is commonly proposed to support the upper part of the body and the limbs by *irons*. Such measures however are, in a large majority of cases, full of mischief; if they can ever accomplish their intention of supporting the head and trunk, it can only be by preventing entirely that active use of the limbs which is essential to the attainment of the proper hardness of the bones. It is constantly observed that the strength and density of bones are in direct proportion to the habitual exertion of the muscles attached to them; and as the latter are made inactive by irons, the application of any such modes of restraint cannot but be injurious to those affected with rickets.

When children first begin to walk, their legs not unfrequently become a little bent. This is especially the case with those that are large and have heavy bodies to bear; but it is not to be regarded as a sign of rickets, and when the muscles of the limbs become stronger, and the bones in their natural process of development grow harder, the curvatures will gradually disappear. The distinction between this kind of bending of the legs and that dependent on rickets may be made by the condition of the general health in each; in the former it is unaffected or may even be more than usually good, in the latter it is always weak and disordered.

RICKMANSWORTH. [Hertfordshire.]

RICOCHET, a word expressing the act of rebounding, is applied to that mode of firing ordnance in which (the axis of the piece being parallel, or inclined at a small angle to the horizon) the shot or shell, having described a curve in the air, descends to the ground, and, after striking or grazing it, rises upwards; when, by the force of the impulsion, and the power of gravity, it describes a second curve of small elevation: the shot, then descending as before, again grazes the ground, from whence it experiences a second reflection. This effect frequently takes place several times before the force of impulse is destroyed.

Ricochet firing is most generally employed in the attack of fortresses in order to enfilade or rake the faces of works, whose fire might be directed upon the ground on which the approaches are to be made: for that purpose a battery of the besiegers is placed with its front perpendicular to the prolonged direction of each rampart or parapet, and three or more guns are laid either horizontally or with slight elevations or depressions, according to the position of the battery, so that their shot may pass a little above the crest of the parapet which covers the line to be enfiladed. The same mode of firing is also occasionally employed by the besieged against the batteries of the enemy. In either case the intention is to dismount the artillery by causing the shot or shells to strike it obliquely behind the parapet or epaulement, or to destroy the traverses which cover it. It is also used to compel the troops to abandon the parapets, or to destroy the palisades of the covered-way or ditches, so as to facilitate the entrance into a work when an assault is to be made by main force.

The practice of firing à-ricochet was first tried by Vauban at the sieges of Philipsburg and Mannheim, in the war of 1688; and in a letter which that engineer wrote to Louvois, he states that at the former place it had succeeded so far as to dismount six or seven pieces of cannon, and oblige the defenders to abandon a long branch of a hornwork and a face of one of the bastions in front of the ground on which the chief attack took place. The success of ricochet firing appears to have been still greater at the siege of Ath, which was conducted by Vauban during the same war.

It is a remarkable circumstance that, soon after the invention of this method of firing, the changes which were made in the trace or plan of fortifications, though attended with many and great advantages, were such as to render the works more liable than those of former times to the destructive action of the ricochet. The great saliency then given to the ravelins, and the consequent acuteness of the salient angles, allow the prolongations of the faces to be easily observed by the besiegers while at a distance from the work; and thus the guns in the ricochetting batteries are enabled to enfilade the faces in their whole length with great accuracy. The faces of the bastions were also lengthened about the same time; and in fortifications constructed on the inferior polygons, or those of few sides, there is a like facility of dismounting the artillery on those faces. The latter evil ceases to exist when the works are formed on the superior polygons, because the prolongations of the faces of the bastions may then fall upon the intermediate ravelins, and thus be invisible to the enemy; but, for the damage to which the long faces of the ravelins are exposed, no other remedy can be found than in the construction of traverses or blindages on the terrepleins, or in covering the general direction of the faces by an advanced portion of the latter, about twenty yards long, on each side of the salient angle.

The French engineers divide ricochet firing into two kinds, of which one is designated *ricochet mou*, and the other *ricochet tendu* (short and long ricochet); the former comprehending all elevations of the piece, from the greatest which the charge and the gun-carriage will permit, to that which is but little above the horizon; and the latter term being applied to all other cases, down to that in which, from the height of the battery, the gun is depressed below the horizontal plane. When the crest of the parapet which covers the rampart or the ground to be ricochetted is above the level of the battery, the coincidence of that crest with the vertex of the trajectory forms the inferior limit to the elevation of the piece; for if the shot were to pass closely over that crest with a lower elevation, it would at that place be in the ascending branch of the curve, and then the ground behind the covering parapet would not, to a considerable distance from thence, be struck. In proportion as the elevation of the piece is increased above the same limit, the vertex of the trajectory is nearer to the battery, and thus the shot is in the descending branch when it passes over the crest of the work.

When the parapet over which the shot is to pass has little elevation above the battery, it requires considerable charges to allow the vertex of the trajectory to coincide with the crest; but the charges diminish rapidly as the height of the parapet increases, or as the distance of the battery from thence diminishes: the effect of this is to produce the kind of ricochet first mentioned above, for the angle made by the descending branch with the horizontal ground being greater, the rebounds of the shot are more numerous within a given extent of ground, and between the successive grazes the curves are higher and shorter. In this case, and when the descending branch passes through the crest, the shot falls almost immediately behind the parapet, and no part of the ground to be ricochetted is free from its action: this is not always certain, when by great charges and low elevations the second kind of ricochet is used, since it may happen that the shot will pass above the objects which it should strike within the limits of the ground. In the modern system of fortification the greatest length of the faces of works which are liable to the ricochet is about 100 yards; therefore when there are no traverses on the terreplein, and it is merely required to strike an object somewhere between the crest of the covering parapet (supposed to be about 8 feet high) and the further extremity of any such face, the descending branch of the trajectory will make with the horizon an angle of about one degree, and the charge and elevation of the gun should be determined so that this condition may be fulfilled. From shot so fired a traverse near the covering parapet would entirely protect the ground, since the projectile would lodge in it, and do no harm to the defenders; and in order that the fire of shot may do execution, whether made in that manner or with an increased elevation of the piece so as to produce recochets, it is necessary previously to destroy the traverse by shells fired as above described. For such a purpose General Millar's 8-inch howitzers will probably be found to be the most serviceable; and if the large shot subsequently fired a ricochet to dismount the artillery should not succeed in clearing an enemy's work of the troops who defend the parapet, spherical case shot fired from 24-pounder guns might be advantageously employed. One gun in a ricochet battery should be exactly in the prolongation of the crest of the parapet on the face to be enfiladed, in order that its shot may graze, with the long ricochet, the interior slope of such parapet.

Experiments in ricochet firing were carried on at Woolwich, in the months of June and October, 1821, when a work 100 yards long, and resembling the face of a bastion or ravelin, was enfiladed in that manner with iron and brass ordnance of different natures; the covering face was eight feet high, and its crest was nearly on a level with the axes of the guns in the battery. The results were, that with a range equal to 400 yards, and a charge of powder equal to $\frac{1}{12}$ of the weight of the shot, about two-thirds of the number of rounds took effect; at 600 yards, with charges varying from $\frac{1}{12}$ to $\frac{1}{10}$ of the weight, from one-third to one-half took effect; and at 800 yards, with charges from $\frac{1}{12}$ to $\frac{1}{10}$, between one-third and two-thirds took effect. It was concluded therefore that ricochet batteries ought, if possible, to be at a distance varying from 400 to 600 yards from the nearest part of the line of rampart to be enfiladed; for beyond the latter distance the effect of the fire is uncertain. The long ricochet, with high charges and small elevations or depressions of the guns, may however be advantageously employed in firing from the ramparts of a fortress on the ground in front, or against extensive lines of works when the battery is at a much greater distance.

It appears from the experiments above-mentioned that the best elevations of ordnance for enfilading a work à-ricochet with shot or shells is that in which the axis of the piece is directed at an angle varying from 6 to 9 degrees above a line drawn from the chamber of the gun or howitzer to the crest of the parapet over which the projectile is to pass. It is stated that of 170 shells filled with powder which were fired, 58 took effect, but only 33 burst in the work. Before the traverses were constructed several guns on the work were struck and rendered useless; but afterwards, though the traverses were much injured, none of the gun protected by them were disabled.

When employed against troops in the field, ricochet fi is found to be of essential service; for the shot maki the ground eight or ten grazes, it cannot fail at these to take effect. In 1757, the King of Pru several six-inch mortars mounted on travelling car and from these he caused shells to be thrown à-ricoc an oblique direction, against the enemy's line, which it mediately put in great disorder.

Ricochet firing, when first employed in sieges, from defenders not being prepared with means to diminish destructive effects, produced immediately a strong sion of its power; and the opinion of its superiority direct mode of firing has continued to prevail from the of Vauban to the present day, though the service of lery is now so precise, that when the guns in an en work can be seen, they can be as readily dismounted latter mode as by the ricochet. It ought also to be r bered that before the latter can be usefully employ parapets, traverses, or blindages which cover the artiller a fortress must be ruined by other means; and it sonably be concluded that the rapid reduction, or protracted defence of a place, will always be owing to a judicious combination of the different modes in which, according to the circumstances, artillery can be used during the siege. [SIEGE.]

RIDEAU CANAL. [CANADA.]

RIDING. [YORKSHIRE.]

RIDINGER, JOHN ELIAS, was born in 1695, at U in Suabia, and was instructed in drawing by his fatl who was a schoolmaster, and in the rudiments of pain by Christopher Rasch. His genius led him to ani painting. 'He was,' says Fuseli, 'one of the greatest signers of animals of every denomination whom the annal of painting can produce. If he has been excelled by Ru gendas in horses, and by Rubens perhaps in the dignity of the lion, he far surpassed them and the rest his predecessors and contemporaries in the wide extent o his powers over every species of brute creation.' Bry thinks this encomium exaggerated 'by the pardonab partiality of his countryman and biographer M. Fuseli' (bu Fuseli was a Swiss, not a German). His biographer in 'Conversations Lexicon' says, 'No painter ever represent with such truth the characters of wild animals. His lineations of them are, as it were, their natural histo They take the spectator into the recesses of the forest amidst lions, tigers, and other wild beasts, whose figures dens, and mode of life are represented by him with the ac curacy of a naturalist. His landscapes are always suited t the animals. He was less happy in the representation the human figure, and of tame animals, for instance horses. His paintings are rare, for he painted but little his time being almost wholly taken up by his nun drawings, which are executed with great accuracy taste. The largest and most choice collection of (about 1400) are in the possession of Mr. Weigel at L His copper-plates or etchings are very numerous, of the following are considered as the best:—eight plates wild animals; forty plates of observations of wild an fables of animals, sixteen plates; hunting of animals chase by dogs, twenty-eight plates; Paradise, in twe plates. The coppers are in the possession of Schl repository of arts at Augsburg. Old impressions are sca— and pretty high in price.' Ridinger was chosen, 1757, rector of the Academy of Painting at Augsburg, where died in 1767. His sons Martin Elias and John Jacob fol lowed their father's profession. The first, and Ridinger' son-in law John Gottfried Seuter, had some share in th execution of his copper-plates. The latter engraved i mezzotinto.

RIDLEY, NICHOLAS, was born in the county Northumberland, near the beginning of the sixteenth turv. He was educated first at Newcastle, and afterw at Pembroke College, Cambridge. He received further struction in France, and having gained some reputation f learning, returned to Cambridge, took orders, and becam master of his college. His knowledge and power of preaching having attracted the attention of Cranmer, he was pre sented with clerical preferment, became one of the k chaplains, and in 1547 was nominated bishop of Roche His denunciations from the pulpit of the use of images a of holy water soon showed him the strenuous supporter

Protestant doctrines, and his abilities caused him to be associated with the principal reformers both in their chief ertakings and discussions. He frequently disputed on substantiation and other doctrines: and he sat as a mem- of the commission appointed to examine into charges ought against Bonner, bishop of London. The commis- leprived Bonner of his dignities, and, after some time elapsed, Ridley was appointed his successor in the see f London. Soon after his appointment he commenced a isitation of his diocese, actively endeavouring to diffuse rotestant doctrines, for the better understanding of which e assisted Cranmer in framing forty-one articles, which ere subsequently promulgated. He was nominated bishop Durham, but his appointment was never completed. ee instances are mentioned, in which he attempted great s by the force and power of his preaching: he aimed at conversion of the Princess Mary, went to her residence don, and requested permission to preach before her. permisssion she peremptorily refused, and so offended ey, who afterwards showed considerable generosity a ready sense of forgiveness, by interceding with Edward on Mary's behalf, that she should be allowed the free exercise of her religion. Secondly, he endeavoured through his preaching to direct the young king's mind to works of charity, describing three sorts of poor—such as were so by infirmity, by accident, or by idleness. Edward, deeply impressed by this sermon, ordered Grey Friars' church, with its revenues, to be a house for orphans; St. Bartholomew's, near Smithfield, to be an hospital; and gave his own house of Bridewell to be a place of correction and work for such as were wilfully idle. (Burnet.) Thirdly, at the instigation of the supporters of Lady Jane Gray, whose case he espoused, he set forth her title in a sermon at St. Paul's, warning the people of the dangers they would be in, and the ruin that would befal the Protestant cause, if the Princess Mary should come to the throne.

On Mary's accession, Ridley was immediately imprisoned. Her detestation of his opinions was aggravated both by the services he had rendered to the Protestant cause and his opposition to her accession. She committed him to the Tower, in July, 1553, and did not suffer him to be removed until complaints were made that the most learned Protestants were restrained from attending the discussions maintained by the Catholics and the Reformers on different disputed points. In April, 1554, a convocation was appointed at Oxford, at which the doctrine of the real presence was to be discussed, and since Cranmer, Ridley, and Latimer were esteemed the most learned men of their persuasion, the queen granted a warrant for removing them from the Tower to the prisons at Oxford. Each disputed in his turn amidst great disorder, shoutings, tauntings, and reproaches; all were considered to be defeated, and all were adjudged obstinate eretics. Ridley never again left Oxford. He was recon- ted to prison, and after resisting many efforts to induce to recant, was led with Latimer to the stake on the of October, 1555. The place of his execution was in of Baliol College. Gunpowder was hung to his neck, it was long before the flames penetrated the mass of l, and explosion did not terminate his miserable suffer- s until his extremities were consumed; he bore his ares with undaunted courage. Burnet says that for his , learning, and solid judgment, he was the ablest man that advanced the Reformation.

Foxe's *Acts and Monuments;* Burnet; Rapin; Lingard; ; and Wood's *Athenæ Oxonienses*, in which a list of itings is given.)

ENZI. [PAPAL STATES.]

ES, FERDINAND, an eminent composer of the n school, was born at Bonn on the Rhine, in 1785. at first educated under his father, afterwards re- instructions from Bernhard Romberg, and finally had lessons in composition from Albrechtsberger, the cele- d theorist, to whom he was recommended by Beethoven, great composer candidly confessing that he possessed talent for teaching, which he considered as a 'par- gift.' But the young musician was studious and us, and acquired from books more knowledge than ned from oral communication. His first profes- l attempts were made at Munich; his next at Vienna, he remained till 1805, when he was drawn as a for the French army, which then occupied the A but, having early lost the use of one eye, qualified for military service. He afterwards went to Paris, and composed much, but not successfully. The Beethoven school, to which he belonged, was then but little understood out of Germany. He afterwards proceeded, through Hamburg, Copenhagen, and Stockholm, to St. Petersburg, where fortune began to smile on his efforts, and was preparing to set out for Moscow, but the French army again deranged all his plans, and he finally determined to seek the English shores, where alone he could hope to pursue his peaceful art undisturbed. He arrived in London in 1813, and was immediately received by the liberal violinist Solomon, who procured his admission into the Philharmonic Society, where his symphonies were performed with great applause, and he exhibited his talents as a first-rate pianoforte player. He now was most actively engaged, both as a composer and teacher, and by his unwearied exertions amassed a handsome independence. In 1824 he returned to his native country, continuing however to exercise his talents as a composer, and, besides many works for the pianoforte, produced two German operas, and an oratorio, *David*, a work of more than ordinary merit. But his early efforts and privations, his unintermitting and exhausting labours, undermined his constitution, and to these he may be considered to have fallen a victim. He died at Frankfort in 1838.

RIESENGEBIRGE. [GERMANY.]

RIETI. [SPOLETO, PROVINCE OF.]

RIETI, the antient *Reate*, once one of the principal towns of the Sabini, and now the chief town of a province of the Papal State, which has retained the name of Sabina to our own times, but is now annexed to the delegation or administrative division of Spoleto. Rieti stands on an elevated plain about one thousand feet above the sea, which is part of the western highlands of the Apennines, a large tract which projects out of the central chain of the Abruzzo. This tract begins at the ridge east of Antrodoco, which forms the boundary between the table-land of Aquila, 2500 feet above the sea, the waters of which run by the Pescara to the Adriatic, and the basin of the Velino, or of Rieti, the waters of which run into the Tiber. This mountain-region, which belongs partly to the Papal and partly to the Neapolitan territories, was the country of the antient Sabini. Its length is about 70 miles from north to south, from the sources of the Nera at the foot of Mount Tetricus above Norcia, to the sources of the Anio above Subiaco. Its greatest breadth, from the defile east of Antrodoco, on the road from Aquila to Rieti, to the fall of the Velino near Terni, is about thirty miles on the map. The Nera forms the northern boundary of this mass of highlands, and drains the northern part of them by means of the river Corno, which rises near Leonessa, and flowing northwards through a narrow glen near Norcia, joins the Upper Nera near Cerreto. The Velino and its affluents drain the central and by far the largest part of the highland region. The Anio drains the southern part as far as the ridge which divides its waters from those which flow eastward by the Sacco into the Liris. The Anio falls by a cascade at Tivoli into the lowlands of the Campagna, and thence flows into the Tiber. The two waterfalls of the Velino and Anio are the only outlets by which the waters of the highlands of Sabina find their way westward to the Tiber.

A succession of mountain-ridges form the western boundary of the highlands of Sabina on the side of the Tiber, extending from the Anio at Tivoli to the Nera above Terni. The southern part of this range near the Anio is known by the antient name of Lucretilis, now Monte Gennaro; and the northern part, which extends to the Nera, by the name of Mount Canterius, which is seen from the valley of the Tiber towering to the eastward above the towns of Magliano, Calvi, Otricoli, and Narni. The eastern boundary of the region of the Sabini is formed by the lofty ridge of the central Apennines, consisting of the groups of Monte Sibilla, 7200 feet; Mount Terminillo, north-east of Rieti, 7000 feet; and Mount Velino, 8180 feet. Between these two ridges lies the basin of the Velino, the lower part of which forms the plain of Rieti. The Velino has its source in the central Apennines, about fifteen miles north of Antrodoco, at the foot of Mount Cenatra, not far from the sources of the Tronto, which flows on the opposite or eastern slope to the Adriatic. [ASCOLI.] The Velino first flows southward through a narrow and deep glen until it reaches Antrodoco, where it turns to the west, passing by Civita Ducale and Rieti. Before it reaches the latter town, it receives the Salto or Imele from the south. The Salto rises near Tagliacozzo, not far from the lake Fucino, and flows north-west through a secluded but interesting valley called Cicolano, belonging to the Neapolitan territory. This valley has been explored of late years by Dodwell and by Keppel Craven, for the purpose of examining the remains of Cyclopian constructions which are scattered all about this district, and which are supposed to belong to the towns of the aborigines mentioned by Dionysius (i. 14) as destroyed long before his time. (Keppel Craven, *Excursions in the Abruzzi*, 1838, vol. i., chap. 7.) Others look for those towns, Palantium, Batia, Tiora, and Lista, on the banks of the Velino above Rieti, where remains of Cyclopian walls are also found. (Review of Dr. Cramer's *Description of Antient Italy*, in the 'Quarterly Journal of Education,' No. xiv.) Cutiliæ, another town mentioned by Cato and Dionysius, is supposed to have been also in the valley of the Velino near Paterno, where there is a small but deep lake, which is still called Cutilia. The ruins of Trebula Mutusca are south of Rieti, near Osteria Nuova, on the Via Salaria, and in the same direction are the remains of Cures, near the village of Correse; at the foot of Mount Lucretilis are other remains, supposed to be those of Suna and Orvinium, also mentioned by Dionysius as cities of the aborigines.

In modern times the district of Cicolano, in the valley of the Salto, has acquired a certain historical interest on account of the tragical end of the Cenci, a Roman baronial family of the middle ages, the head of which, Francesco Cenci, was murdered in the castle of Petrella, at the instigation of his wife and daughter, who were put to death after a long trial, which has been the subject of many compositions both in prose and verse.

The Velino, after its confluence with the Salto, passes through Rieti, dividing the city from the suburb, and then turning to the north-west receives the Turano also from the south. The Turano, the antient Telonius, rises in the Neapolitan territory, not far from the Anio, in the mountains which border the basin of the Fucino to the westward, and on the opposite side of which the Liris has its source. The Turano runs in a north-west direction nearly parallel to the Salto, passes by Carseoli on the Via Tiburtina, which leads from Tivoli into the country of the Marsi, flows along the eastern base of Mount Lucretilis, and then enters the plain of Rieti, where it joins the Velino after a course of about 40 miles. In the valley of the Turano, the greater part of which lies in the Papal State, but which, like the rest of this region, is almost unknown to travellers, is the town of Rocca Sinibalda, near the site of the antient Trebula Mutusca. It was on the banks of the Telonius that the consul P. Rutilius and 8000 men were defeated and killed during the Marsian or Social war.

The plain of Rieti is one of the most delightful spots in Italy. It is covered with plantations of mulberry-trees, vines twining round elms and maple trees, fields of wheat, Indian corn, beans, flax, hemp, wood, and vegetables of every kind. It is traversed by two clear streams, which unite their waters about three miles below the town of Rieti, whose churches, steeples, and other massive buildings make a fine contrast with the brilliant verdure of the surrounding country. Farther down the river, between the right bank and the base of the Apennines, is a succession of marshes and lakes, the largest of which, called Piè di Luco, is about 10 miles in circumference; the banks are very bold and picturesque, but are considered unwholesome. The waters of the lake have an outlet into the Velino. Near this place the two ridges, eastern and western, which bound the plain of Rieti, approach near each other, leaving only a narrow gorge through which the Velino flows on a rocky bed with a rapid declivity until it reaches the edge of the terrace, where it falls into the valley of the Nera amidst clouds of mist. According to the measurement taken by the engineer Brandolini, the whole perpendicular height from the edge of the rock to the level of the Nera below is 143 mètres, or about 455 English feet. The fall however is broken into two parts, the first of which is perpendicular, after which the water forms a succession of cascades or rapids, until it meets the Nera. A pavilion called 'la Specola,' erected by Pius VI. on a projecting shelf of rock which overhangs the precipice, commands a fine view of the fall and of the valley of the Nera below. The cascade, called Della Marmora, has been considered by many as the finest in Europe, the mass of water being superior to all the Alpine cascades, and the height far superior to the fall of the Rhine at Schaffhausen. A rainbow is often seen hovering on the mist produced by the spray:

> A matchless cataract!
> Horribly beautiful! but on the verge,
> From side to side beneath the glittering morn,
> An Iris sits, amidst the infernal surge.
> (*Childe Harold*, canto iv.)

The best view of the cascade is from the banks of the Nera below, about three miles distance from the village of Papigno, which is near Terni. (Tournon; Valery.) The name of Marmora has been given to the mountain from which the river falls, on account of the abundant incrustations, resembling marble, produced by the deposit of the waters of the Velino. The inhabitants of the neighbouring country are said to be subject to the gravel and the stone.

The valley of the Velino is said to have been in very remote times occupied by the Umbri, before that people descended from the highlands of the Apennines into the valley of the Upper Tiber, which has ever since retained the name of Umbria. [ETRURIA.] After the migration of the Umbri, another race of mountaineers from the central parts of the Apennines about Amiternum, near the sources of the Aternus or Pescara, became possessed of the valley of the Velinus; they were known by the name of Sabini, and they spread from thence into the country between the Nera, the Anio, and the Tiber, which they occupied almost as far as the gates of Rome. [OSCI.] The Sabini were a remarkable people; their manners were simple, and their habits austere; they had a reputation for good faith and domestic virtue. They were religious, and even superstitious, and their country was famed for omens and prodigies. Prodigies, such as monstrous births, showers of stones, &c., are mentioned by Livy (xxv. 7; xxvi. 23; xxxvii. 3; lx. 11; liii. 13) as being of frequent occurrence at Reate previous to some great event or calamity. The Sabini had adopted a periodical system of emigration. As their population increased beyond the means which the country afforded, they sent out colonies in the spring of the year, and the migration was attended with religious ceremonies. The Piceni and Samnites were colonies of the Sabini, anterior to the foundation of Rome. The subsequent history of the Sabini forms part of the history of Rome.

The principal towns of the Sabini were:—Amiternum, Testrina, Reate, Cures, Nursia, Eretum, Trebula Suffena, Mutusca, and Nomentum; the last was in the lowlands of the Sabini, which extended on the side of Rome as far as the confluence of the Anio with the Tiber.

The name of Sabini has continued to be applied to the country of the antient Sabini down to our own times. Previous to Napoleon's occupation of Rome, in 1809, Sabina was one of the provinces of the Papal State. After the restoration of 1814, it was styled the Delegation of Rieti, which has been since united to that of Spoleto. [SPOLETO E RIETI, PROVINCE OF.]

The plain of Rieti was almost entirely covered with water, when the consul M. Curius Dentatus, 240 B.C., made a cut through the rock, deepening and widening the outlet for the waters of the Velino, and drained thereby the fields of Reate. The outlet must have existed before, for the waters of the valley above could have no other issue, but the natural channel was probably not deep enough to prevent the country being overflowed, until Dentatus deepened it. The people of Interamna, or Terni, complained of the damage occasioned to their fields by the overflowings of the Nera, in consequence of the additional stream thus poured into it. The senate sent a consul and ten legates to the spot to decide the matter, and Cicero repaired thither to plead for the people of Reate. (*Ep. ad Atticum*, iv. 15.) The result was that the cut was maintained.

Under Tiberius the question was again agitated in the senate: this time it was the people of Rome, who, alarmed at the inundations of the Tiber, ascribed them to the Velinus, the Clanis, and other affluents of the Tiber. The Reatini made a sensible defence, and the opinion of Piso, who was for maintaining things as they were, was adopted. (Tacit., *Ann.*, i. 79.) In more modern times the bed of the Velino above the fall has repeatedly become obstructed by calcareous deposits, and the river has again overflowed the plain; to remedy which Pope Paul III. made a new cut, and Clement VIII. afterwards restored the old one made by Curius. (Angelotti, *Descrizione di Rieti*.)

Reate is said to have derived its name from Rhea or Cybele, the antient patroness of the place. Like the rest of the Sabini, Reate was an early and constant ally of Rome, and is mentioned by Livy as having, together with Amiternum, furnished soldiers for Scipio's expedition to Africa. Cicero, in various places, extols the fidelity of the Sabini, and particularly of the people of Reate. (*Pro Ligario*, 11, and the third *Catilinaria*, 2.) The Flavian Gens was originally from Reate. Vespasian was born at Falacrina, in the valley of the Upper Velinus, above Reate, and he died there, and his son Titus after him. Remains of the baths built by those two emperors are still seen in the territory of Rieti. Near San Lorenzo, which is on the Via Salaria, on the summit of the ridge between the valley of the Tiber and the plain of Rieti, is a spot still called Titabalnea, with considerable remains of Roman brick-work.

In more modern times the people of Rieti were among the first to pay voluntary allegiance to the see of Rome, as their temporal sovereign, in the time of Pope Adrian I., their deputies cutting their hair and beard in token of submission. Rieti was often an asylum for the popes in the middle ages, when driven away from Rome by faction or foreign invasion. In our own times, in March, 1821, the Neapolitan constitutionalists, under General Pepe, were defeated by the Austrians near Rieti. In 1831, the people of Rieti showed their devotedness to the papal see by repulsing the insurgents from Bologna and Romagna who were advancing towards Rome.

Rieti is built partly on the slope of a hill, and partly at the foot of it; it is a bishop's see; it has a college and a clerical seminary; it has also manufactures of coarse woollens, silks, glass, and leather. The population amounts to about 9000, among whom are many wealthy landed proprietors. The town-house, or governor's palace, is a massive building, in the highest part of the town, and enjoys a splendid view of the surrounding country. The cathedral was built in the twelfth century, but has been repeatedly restored. There are several other churches and convents, as well as the episcopal palace, which are worthy of notice.

(Angelotti, *Descrizione della Città di Rieti*, 1635; Maroni, *Commentarius de Ecclesia et Episcopis Reatinis*, 1763; Galotti, *Mémorie di Tré Antiche Chiese di Rieti*, 1765; Sperandio, *Sabina, Sacra e Profana, Antica e Moderna*, 1790.)

RIFLE, or RIFLED, a term applied to muskets or pieces of ordnance when their bores are furrowed with spiral grooves. It is probably derived from an Anglo-Saxon word signifying to *rive* or *tear;* the grooves or channels being formed by a machine which scrapes away the substance of the barrel interiorly in parallel and serpentine directions.

It is not precisely known at what time rifled barrels were first employed in warfare, but P. Daniel states (*Hist. de la Milice Françoise*, liv. vi.) that the carabiniers of the French cavalry were furnished with such arms; he also observes that they had been invented long before the time at which he wrote, and that he had seen them used before that class of troops was formed into a regiment. This circumstance took place in 1692, and we may therefore conclude that rifled arms were known on the Continent about the middle of the seventeenth century. The historian describes the *carabines rayées*, as he calls them, as being grooved in a circular manner along the whole of the barrel; and he asserts that the range of the balls fired from them was very considerable. Rifled arms do not appear to have been introduced in the British service till the time of the American Revolutionary war.

A bullet made of lead cast in a spherical form, according to the practice till lately followed, having unavoidably some irregularities on its surface, and, from unequal expansion in cooling, a void space being formed in the interior by which the density is caused to vary in different directions from the centre, it follows that, when such bullet is discharged from a common musket, the atmosphere, pressing unequally against its front on opposite sides of the line of flight, causes it to deviate continually from the direction which, when uniformly resisted, it would take by gravity and the impulse of the fired gunpowder. It will also happen that the bullet acquires, by friction in the barrel, a rotatory motion about some diameter as an axis; and this diameter not coinciding, except by an extraordinary chance, with the proper path of the ball, the pressure of the air, which, when that coincidence does not take place, will be greater on the side of the ball where the revolving motion conspires with the direct motion, than on the opposite side where the two motions are in contrary directions, will, even if there were no irregularity of surface, produce deviation. This will evidently be various, according to the position of the axis of rotation; and since that position may change during the flight of the ball, the path of the latter may suffer several inflexions.

The intention therefore in forming spiral grooves within the barrel of a musket or piece of ordnance, is, to produce a rotatory motion of the shot about an axis which shall coincide with the line of its path, in order that the unequal pressure of the atmosphere in its front, on account of any irregularity in its form or density, may correct itself at every half-revolution of the shot on such axis; so that, on arriving at the object, the deviation may be only that which is due to some fraction of a rotation. The number of spiral channels in a rifle-musket has varied at different times; at first there were eight or sixteen, but the number was afterwards reduced to four, and at present the practice is to have but two. It has not been exactly determined what is the best form for the spiral; sometimes the curve-line makes, in the length of the barrel, 1¼ revolutions about the axis of the latter, but in general one revolution in the whole length (=30 inches) is considered sufficient.

Different methods have been employed for the purpose of enabling the bullet to acquire, by means of the rifle-grooves in the barrel, the intended rotation on its axis. At first the leaden bullet was made spherical as usual, but a little larger than the bore of the musket, and being laid on the muzzle of the latter, it was forced down upon the powder by blows of a mallet applied at one end of a ramrod; thus, during the descent, the bullet being soft, there were formed on a zone of its surface projections which nearly fitted the grooves, and these projections, by moving along the grooves on the piece being fired, produced the required rotation. Some time since rifle-muskets were made so as to admit of being loaded at the opposite extremity of the barrel; a sort of chamber being formed by an enlargement of the bore at that place, the powder and bullet were introduced in it through a perforation made in the side of the barrel, and this, after the piece was loaded, was closed up by a screw which fitted it. Then, on firing the charge, the bullet, yielding to the compression in the bore, acquired projections where the grooves allowed it to expand, and thus it passed into the air with the rotatory motion on its axis. But neither of these methods is now used.

The most general practice of late has been to press the bullets (by means of the ramrod) into the barrel upon a piece of greased cloth or leather (called the *plaster*). This plaster is made of a circular form and greater in diameter than the bore, on the aperture of which it is laid with the greased side downwards; the bullet is then placed upon it, and both being forced down together, the cloth or leather which then covers the lower half of the bullet expands in the grooves, and this is found to be sufficient, when the piece is fired, to give the motion of rotation. At present rifle-bullets are made with a projecting zone which surrounds them on the circumference of what may be called a great circle, and has a breadth equal to about one-third of the diameter. The pieces are loaded at the muzzle, and the parts of the zone which are diametrically opposite to one another are those which pass along the two grooves in the barrel.

Captain Norton's rifle-bullets are nearly of a spheroidal form, and on a circumference perpendicular to the longer axis are two knobs which pass along the grooves when the bullet is pressed into or fired from the piece. The bullets are made hollow like small shells, in order to contain a small quantity of powder, and this, when the bullet strikes the object, is ignited by means of a detonating composition in a cap which covers an orifice in front of the bullet. It is proposed that these loaded bullets should be fired into an enemy's magazine or carriage conveying gunpowder, that by exploding there they may cause the destruction of the ammunition and of any objects which may be in its vicinity.

A bullet fired point-blanc from a rifle-barrel is found to strike an object at a much greater distance from the piece than when it is fired from an ordinary musket, and this was once ascribed to a superior velocity which the rifle was supposed to communicate to the ball. In fact, however, it is caused merely by the correction of the deviation, on which account the rifle-ball proceeds farther than the other in the direction of the line of aim; for Mr. Robins found by experiment that both the velocity and the range of the former were less than those of the latter, and he justly attributes the circumstance to the greater friction which the ball experiences in moving along the rifle-grooves than in passing through a simple barrel. He also ascertained that the velocity and range of a rifle-ball were greater after the piece had been long in use than they were at first, probably on account of a diminution of friction consequent upon an enlargement of the breadth of the grooves.

Mr. Robins moreover proved by experiment that a rifle-ball in its flight presents always the same side to the front, or rather, that the axis of rotation continues nearly parallel to itself; and to this circumstance he ascribes the deviation which such a ball experiences when fired with an elevation of the piece so that its trajectory becomes greatly curved, for the axis of rotation not coinciding with the direction of the path, the inequality of the air's resistance on different parts of the bullet is no longer corrected by the revolution about that axis. Mr. Robins, in order to remedy the evil, proposed that bullets should be formed like eggs, the longer axis to be placed in the direction of the axis of the piece, and the larger end to be in front; for then, the centre of gravity being thrown forward, there will be a tendency of the axis of the bullet, at least in the descending branch of the curve, to keep in the direction of the line of flight. The suggestion has not however been adopted, and probably such balls would not be found to possess any practical advantages over those which are in common use.

In the year 1774, Captain Blair proposed the formation of rifled guns of iron to be used as field artillery. Agreeably to the old practice, they were to be made hollow in the act of being cast, and in the same operation the grooves were to be formed. The balls were to be of lead with knobs on them to fit the grooves, and they were to weigh not more than two pounds. During the late war, the French attempted to introduce into their service cannon-shot of a cylindro-spherical form, the cylindrical part being in contact with the charge of powder, and a ring of lead surrounding the shot near its middle, so as to render this part rather greater than the bore of the gun. The circumference of the ring, being scraped down by the edge of the muzzle when the shot was forced into the gun, became in close contact with the surface of the bore, and thus no windage was left: by this contrivance it was expected that most of the advantages of a rifled gun would be obtained, though no rotatory motion took place in the shot. The result of the trials was thought to be favourable with respect to the direction and range of the shot, but the labour and time required to load the gun were great, and this circumstance probably prevented the invention from being adopted. No kind of rifle ordnance has ever been used in warfare, and the spherical form has always been found preferable to any other for shot.

It may be mentioned here, that bullets for common muskets, as well as for rifle-barrels, are not now cast in their actual forms, but are made from lead which has been previously cast in cylindrical rods rather greater in diameter than the intended ball. Each rod is passed between two revolving cylinders, whose convex surfaces are indented, and, by the pressure, the rod becomes a series of rudely formed beads: the rod in this state is passed between two other revolving cylinders, on whose convex surfaces are several corresponding hemispherical cavities, and the pressure then reduces the beads to a spherical form, the whole series of balls being connected together by a thin portion of lead where the hemispheres of the balls unite; this portion being afterwards removed, the bullets are complete. The cavities for rifle-bullets allow, during the pressure, a projection to form itself about each in the manner above mentioned. The great pressure to which the lead is subject when passing between the cylinders, by forcing the particles together, fills up any vacuities which may form themselves in the rods during the cooling process, and probably renders the density of the ball nearly uniform.

RIFLEMEN (called by the French *tirailleurs*) are soldiers whose duties correspond nearly to those of light-infantry troops, but their muskets being rifled or grooved, the effect of their fire, within certain limits, is more certain.

In the preceding article we have stated what is known concerning the first use of rifled barrels on the Continent: and in the article ARMS it has been shown that the duty of riflemen is indicated in the 'Observations' compiled by the earl of Albemarle in 1646. The Anglo-American people are however believed to have been the first who organised corps of infantry armed with rifle-muskets, and during their struggle for independence the fire from those pieces too often took effect with fatal precision against the officers and in the ranks of the British forces. From that time the incorporation of bodies of riflemen with the armies began to take place among the nations of Europe, and it is now become a general practice. In the British service, the 60th, formerly called the Royal American regiment, is a rifle corps; and Manningham's rifle corps appears in the 'Army List' for 1801, but this became, in 1803, the 95th regiment. In 1816 it was formed into the present rifle-brigade, and placed under the command of Sir David Dundas, who had before been colonel of the 60th regiment. Subsequently to that year, a regiment of native riflemen has been raised in Ceylon, and a rifle corps of cavalry at the Cape of Good Hope.

When a company or corps of riflemen act with closed ranks and files, the manner of performing the exercises differs but little from that which is practised by other troops of infantry; the men however are instructed to be careful that the rifle do not fall to the ground, as it is easily damaged, and on service it may happen that it cannot be repaired or replaced.

If a corps of riflemen is detached from a main body of troops in order to skirmish with the enemy, one-half advances with trailed arms about 100 paces towards the front, when it extends its files so as to cover the whole body from which it was detached, while the other half advances only 50 paces, and remains at close order for the purpose of supporting the former party. On a signal for alarm being given, the skirmishers retire quickly through their respective intervals in the main body, and re-form themselves in its rear. When a body of troops retreats across a plain, the riflemen on the right and left flanks of each division remain fronted, while the main body faces to the right-about and retires; those men then extend themselves so as to cover the retreating troops, whom they follow at the distance of a few paces, keeping off the enemy's flankers at the same time by their fire.

On firing at close order, the two right-hand files of each section step three paces to the front, and the rear-rank men step to the right of their file-leaders. Each man fires as soon as he gets proper aim; then, resuming his place in the company, he reloads. When the two first files have fired, the two next advance, and so on through the whole company. Rifle-firing in extended order is performed by sound of bugle, and the regulation is, that the whole body of men should not have their pieces unloaded at the same time. For this purpose, on the signal being given, each man of the front rank selects his object and fires; then, as soon as each rear-rank man sees his file-leader put another ball in his piece, he fires through the interval between two front-rank men. Afterwards, when the rear-rank men are putting other balls into their pieces, they give notice to their file-leaders that they may fire; and this is continued, the men either standing or lying on the ground, till the signal is given to cease.

On a signal being made to fire advancing, each rear-rank man moves briskly six paces before the front rank and fires; then, after reloading, he trails his arms. When the serjeant of the front rank sees the other rank reloading, he steps forward and gives a signal with his whistle, on which the front-rank men pass six paces before the rear-rank and fire, and so on alternately. If the signal be made to fire retreating, the rank which happens to be in front fires and then goes twelve paces to the rear of the second rank; there each man faces to the front and reloads. As soon as the the sergeant on the flank of the second rank sees the first-rank men loading, he gives a signal with his whistle, on which the second rank fires and goes twelve paces to the rear of the former men; and so on. The ranks thus support one another by their fire, till the signal is made to halt.

RIFLE BIRD. [PTILORIS.]

RIGA. [LIVONIA.]

RIGA (in the language of Livonia, *Righa*; in that of Esthonia, *Riolin*), the capital of the government of Livonia, is situated in 56° 55′ N. lat. and 24° 12′ E. long., on the right bank of the Düna about seven miles above its entrance into the Gulf of Riga. The width of the river and the distance of the town from the sea make the port very spacious and secure, and the merchantmen come up to the quays. In summer a bridge of pontoons, loosely attached to piles, and rising and falling with the tide, is laid across the river; this bridge is 40 feet wide and 2600 feet long, and is a pleasant and fashionable promenade in the summer time. The town is surrounded with ramparts and bastions. It has a strong citadel, and is otherwise well fortified, so that it is considered one of the most important bulwarks of the Russian empire. It consists of the town itself, of one suburb within the palisades, and of two more distant suburbs on the left bank of the Düna. There are three gates towards the country and four towards the Düna. About 1000 of the 4000 houses are of stone, many of which are large and handsome, but the streets are narrow and crooked, and the town dark and gloomy. There is but one inconsiderable market-place, and a pretty spacious parade before the palace, in which the merchants erected, in 1817, a granite column, twenty-three feet high, surmounted by a bronze statue representing the goddess of Victory, nine feet high, in memory of the triumphs of the Russian arms in 1812-13. Of the 14 churches, 6 are Lutheran, 4 Greek, 1 Calvinist, 2 Livonian, and 1 Roman Catholic; of the Lutheran the most remarkable are the large and lofty cathedral, attached to which is a quadrangle surrounded with cloisters, and which contains the museum and the public library of 18,000 volumes, and St. Peter's church, which has a fine tower commanding an extensive view of the harbour. The other public buildings are, an imperial palace, with an observatory; the residence of the civil governor; an ancient palace, partly used as the residence of the military governor, partly serving for barracks; the town-house, containing the Exchange; the assembly-house of the estates of Livonia; the arsenal, the hospital of St. George, the Catherinenhof, a bomb-proof warehouse 445 feet in length, and a theatre. There are numerous literary and useful institutions, as the gymnasium, the economical society, the society for the study of the history and literature of the Baltic provinces, the cathedral school, and the commercial bank.

The town of Riga was founded about the year 1200, by Albert, the third bishop of Livonia, Christianity having been introduced in the middle of the century, by Meinhard, a monk of Bremen, who was ordained by the pope as first bishop of Livonia. The founder granted it several privileges and a considerable extent of territory. The city, which was at that time a colony of Germans, soon became rich and powerful, and in the thirteenth century joined the Hanseatic league, and its commerce was the source of such great wealth that the power of the city and the pride and luxury of the inhabitants became proverbial. At the beginning of the sixteenth century it belonged to the Teutonic knights, who were obliged to submit to Poland in 1561; but Riga, which had embraced the Reformed religion, fearing a Popish master, refused to recognise the sovereignty of the kings of Poland till 1581, when it obtained the guarantee of its antient privileges. From that time its prosperity declined. In 1621 it was besieged and taken by Gustavus Adolphus. In 1710, after a vigorous defence, it was taken by Peter the Great, when half the town was in ruins, many hundreds of the inhabitants had perished by the enemy's fire, and 20,000 had been carried off by the plague during the siege. In the siege of 1812, the suburbs, with nearly 800 large houses, besides the smaller houses and outbuildings, and four churches, were burnt, and also 200 houses in the town itself, and 1500 inhabitants perished. The suburbs have been rebuilt, and are much handsomer than before. It has likewise suffered several times by fires and inundations, to which latter it is much exposed by the banks of the river being very low. Thus at the breaking up of the ice in 1814, 400 houses were swept away with their inhabitants, immense quantities of timber, and eighty vessels laden with hemp. The loss was above thirty millions of rubles. Before the rapid rise of Odessa, Riga was the third city in point of population in the empire: it is now the fourth, the population being nearly 60,000, of whom above 30,000 are Protestants, chiefly Germans and their descendants; the remainder are mostly Livonians, the Russians being comparatively few. The numerous ships in the river, the bustle in the streets, and the well-stocked warehouses and shops, are indications of the extensive trade of which Riga is the centre: it is in fact, next to St. Petersburg, the greatest emporium of foreign commerce in the empire. The exports consist of the great staple articles of Russian produce, corn, timber, flax, hemp, linseed, tallow, Russia leather, and sailcloth. It appears from the official accounts, that the quantity of corn exported has considerably decreased of late years; that of hemp has remained nearly stationary; on the other hand, a remarkable increase has taken place in the exports of flax, linseed, and timber.

The number of ships annually arriving at and leaving the port may be stated at between 1200 and 1300. In 1831, the arrivals were 1522, the departures 1483. Of these ships nearly one half are English. The value of the exports is about two millions sterling; that of the imports, consisting of colonial produce, manufactures of woollen, cotton, and silk, wine, &c., is not above one-third of that sum; about two-thirds of the ships arriving at the port are in ballast. It is not only the commerce of Riga that is increasing; it has now considerable manufactories of woollen, cotton, tobacco, starch, looking-glasses, and iron-wares, besides sugar-refining houses, which produce annually five million pounds of refined sugar. (Stein's *Lexicon;* Hörschelmann; Cannabich: Hassel; *Russian Official Journals.*)

RIGAUD, HYACINTHE, a portrait painter, called the Vandyck of France, was born at Perpignan on the 25th of July, 1659. He was the son of Matthias Rigaud, an artist, from whom he learned the rudiments of painting, and upon whose death he was sent by his mother to Montpellier, and placed under various masters, among whom was one Ranc, a painter of portraits in the manner of Vandyck. In 1681 he returned to Paris, and in the following year gained the chief prize given by the Academy. He intended to follow historical composition, but was advised by Charles le Brun to practise portrait, and the same artist dissuaded him from visiting Italy. In 1700 he was admitted a member of the Academy of Paris, and presented as his admission picture a portrait of the sculptor Desjardins, a performance which gained him the highest reputation. His success as an artist was now most brilliant; he frequently painted the portrait of Louis XIV., those of the royal family, the principal nobility of the court, and many of the most illustrious personages of Europe. In 1727 he was pensioned and decorated with the order of St. Michael. He was successively professor, rector, and director of the Academy. Grief for the loss of his wife, who died in 1742, coupled with his advanced age, hastened his own death, which happened on the 19th of December in the following year. He left no issue, and no pupil of note except Jean Ranc, who married his niece, and who became principal painter to the king of Spain. Works by Rigaud are contained in most of the collections of Europe. In the Louvre, besides others, are the portraits of Le Brun, Mignard, and Bossuet. His pictures have been engraved by Edelinck, the Drevets, J. Audran, and other eminent artists, and consist of two hundred historical portraits.

Rigaud is considered one of the best portrait painters of the French school; his heads are full of character and expression, his touch bold and free, yet exquisitely delicate, and his colouring, though brilliant, generally speaking free from gaudiness. In his draperies however he was too apt to express a fluttering effect wholly inconsistent with the repose of the other parts of his work, and in many instances the attitudes of his figures exhibit an unnecessary violence of action. With regard to the title given him of the French Vandyck, it seems difficult to reconcile it with truth, for the charming simplicity of that exquisite painter, one of his most prominent merits, is entirely wanting in the works of Rigaud; nor do the two less resemble each other in their style of colouring and in their management of the chiaro-'scuro. Where the tints of Rigaud are brilliant and dazzling, those of Vandyck are harmonious and chaste; and where the lights of the former are relieved by positive and forcible colour, those of the latter are brought to their proper degree of projection by the gradual depth of the accessories and backgrounds.

(*Biographie Universelle;* Pilkington's *Dictionary of Painters.*)

RIGEL. [ORION.]

RIGHI'NI, VINCENZO, a composer of great merit, whose works deserve to be better known, and will probably ere long be rescued from the ill-deserved neglect into which they have fallen, was born at Bologna, about the year 1758, and received his musical education under the celebrated Padre Martini, but completed it at Prague, where he acquired a vigour which was not then the attribute of the Italian school. Righini composed many operas for different theatres, among which his *Armida*, *Tigrane*, *Enea nel Lazio*, and *Alcido al Birio* are well worth the notice of the true amateur. He died in his native city, in 1812.

RIGHT. It has been shown in LAW [vol. xiii., p. 301] that the word *right* occurs under some form in all the Teutonic languages; and that it bears a double meaning equi valent to the significations of the Latin word *jus*, namely, *law* and *faculty*. The Anglo-Saxon word bore this double meaning, but *right*, in modern English, has lost the signification of *law*, and has retained only its other meaning.

Right, in its strict sense, means a legal claim; in other words, a claim which can be enforced by legal remedies, or a claim the infringement of which can be punished by a legal sanction. It follows from this definition that every right presupposes the existence of positive law.

The causes of rights, or the modes of acquiring them, are various, and can only be explained in a system of jurisprudence; for example, a person may acquire a right by contract, by gift, by succession, by the non-fulfilment of a condition.

Every right correlates with a legal duty, either in a determinate person or persons, or in the world at large. Thus a right arising from a contract (for example, a contract to perform a service, or to pay a sum of money) is a right against a determinate person or persons; a right of property (or dominion) in a field or house is a right to deal with the field or house, availing against the world at large. On the other hand, every legal duty does not correlate with a right; for there are certain absolute duties which do not correlate with a right in any determinate person. Such are the duties which are included in the idea of police; as the duties of cleanliness, order, quiet at certain times and places.

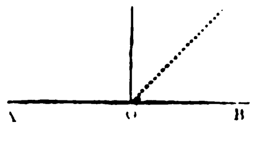
The word right is sometimes used, improperly and secondarily, to signify not legal but moral claims; that is to say, claims which are enforced merely by public opinion, and not by the legal sanction.

In this sense the right of a slave against his master, or of a subject against his sovereign, may be spoken of; although a slave has rarely any legal right against his master, and a subject never has a legal right against his sovereign. It is in the same sense that a sovereign government is sometimes said to have rights against its subjects, although in strictness a sovereign government creates rights, and does not possess them. In like manner, one sovereign government is said to have rights against another sovereign government; that is to say, moral rights, derived from the positive morality prevailing between independent nations, which is called *international law*.

We likewise sometimes hear of certain rights, styled natural rights, which are supposed to be anterior to civil government, and to be paramount to it. Hence these supposed natural rights sometimes receive also the additional epithets of indefeasible, indestructible, inalienable, and the like. This theory of natural rights is closely connected with the fiction of a social compact made between persons living in a state of nature; which theory, though recommended by the deservedly high authority of Locke, has now been abandoned by nearly all political speculators.

RIGHT. (Mathematics.) This term is applied in mathematical language to anything which is imagined to be the most simple of its kind, to distinguish it from others. Thus a right line is a STRAIGHT line; a right angle is the most simple and well known of the angles used by Euclid; a right cone is one in which the axis is at right angles to the base; and so on.

RIGHT ANGLE. When two lines, at first coincident, are made to separate so that one of them revolves about their common extremity, the revolving line will in time become the continuation of the other. This angle or opening, made by a line and its continuation, would, we might suppose, be one of the principal angles considered in geometry, and should, according to the previously defined meaning of RIGHT, be called a right angle. But in the geometry of Euclid the word angle seems to have been essentially connected with the idea of a pointed corner, and we have no means of finding out that he considered a line and its continuation as making any angle at all. Instead of this angle, made by AO and OB, or the angle of opposite directions, he introduces its half, and calls it a right angle. Let AOC and COB be equal angles, that is, let OC bisect the angle AOB, and each half is called a right angle. When the angle AOB is mentioned, it is as two right angles. All that is necessary as to the magnitude of a right angle has been given under ANGLE: we propose here to point out the effects of the forced manner in which Euclid avoids the angle AOB.



It is sufficiently evident that nothing can lose its right to be considered as a magnitude by augmentation: so that the opening of AO and OB, which is double that of AO and OC, must really be a magnitude of the same kind as the angle AOC. Now the consequences of preferring AOC to AOB, as a fundamental angle of reference, are as follows:—

1. The introduction of the apparently very arbitrary axiom, that 'all right angles are equal,' instead of the more simple and natural one that 'two straight lines which coincide in any two points coincide beyond those points.' It is as evident as that 'two straight lines cannot inclose a space,' or 'two straight lines which coincide in two points, coincide *between* those points,' that the same also takes place *beyond* those points. A moment's examination will show that this axiom immediately gives as a consequence that the angle AOB in any one straight line is equal to the angle A'O'B' in any other; or, as Euclid would express it, the doubles of all right angles are equal, whence all right angles are equal. And it is one consequence of leaving the natural route, that Euclid himself has assumed both the more complicated axiom which he has expressed, and also the more simple one by which he might have avoided it: for he nowhere shows that if OA be made to coincide with O'A', then OB coincides with O'B'. Some of his editors have supplied the defect by making it a consequence of 'all right angles are equal,' that 'no two lines can have a common segment.'

2. The necessity of proving a particular case of a proposition which is taken as self-evident in all other cases. Thus Euclid never proves that COD and DOB are together equal to COB; while he has to spend a proposition in proving that AOD and DOB are together equal to AOB.

3. The necessity of proving a particular case after the general case has been proved. Thus to bisect a given angle is the general proposition, of which to draw a line perpendicular to a given line from a given point within it, is the particular case. The construction of the latter is precisely that of the former: but the two results are obliged to be obtained in two distinct propositions: it would be right enough to make them cases of one proposition.

4. The habituation of the student to neglect the angles greater than two right angles, by his never meeting with one *as great*. Two lines which end at the same point make two openings, one greater and the other less than two right angles; except in the intermediate case when both are equal to two right angles. Now Euclid does not positively reject the angle greater than two right angles, nor does he say that of two lines which meet, the angle which they make shall be always taken to be that which is less than two right angles. Had he had such intention, one of his propositions would have been positively false, to wit, that in any segment of a circle, the angle at the centre is double of the angle of the circumference. Had such been his intention, he would have said, 'in every segment *which contains an angle less than a right angle*, the angle at the centre is double of that at the circumference.' It is true that his proposition is, 'In a circle, the angle at the centre is double of the angle at the circumference *when they have the same circumference for a base*:' and some may think that the words in italics exclude (as in one sense they certainly do) the segment which has an angle greater than a right angle; since this angle, and its central angle, that namely which is less than two right angles, do not stand on the same circumference as a base. Let this be so, then we throw the difficulty on another proposition, the 27th. It is there shown that 'in equal circles, the angles which stand upon equal circumferences are equal whether they stand at the centre or *at the circumference*.' If no mention of angles greater than two right angles be intended in the previous proposition, then the one before us is not completely proved, but only when the angle at the circumference is less than a right angle. At the same time there seems to be, in some of the subsequent propositions, proof of a desire to avoid the angle greater than two right angles, and to subdivide proofs into particular cases in order to avoid the difficulty.

But are we not in fact to assume, without particular inspection, from the general tone of the first six books, that the angle equal to or greater than two right angles was never really meant, and that all propositions are to be taken with such limitations as the above restriction would render necessary? Let those who think so, look at the last proposition of the sixth book, in which it is shown that in equal circles angles are to one another as their subtending arcs. Now the criterion of Proportion, as given by Euclid, requires that, in this proposition, any multiple, however great, of the angles may be taken. Now a multiple of an angle may not only be greater than two right angles, but greater than a thousand right angles; and every such multiple must not only be really included in the demonstration, but considered as a magnitude, and compared with other magnitudes of the same kind. It is impossible that the writer of the fifth book should have been unable to bear in mind that the establishment of proportion demands that every possible multiple of the quantities asserted to be proportional should be admitted and compared with every other: and thus it is certain that Euclid must have meant to consider angles not only greater than two right angles, but even greater than four, or any other number. Some commentators have supposed that Euclid meant to omit all pairs of right angles from such multiples, and all semicircumferences from the multiples of the arcs; but this would only be a use of the axiom, that if equals be taken from unequals, the remainders are unequal, which admits the greater of the quantities mentioned to be comparable magnitudes: and that Euclid does consider them as such, is all that is contended for.

RIGHT, PETITION OF. [Petition of Right.]

RIGHTS, BILL OF. [Bill of Rights.]

RILEY, JOHN, born in London, 1646, was the first Englishman that attained any excellence in portrait, unless perhaps Dobson may be considered as an exception, and in that department he remained unrivalled by any native artist until the appearance of Sir Joshua Reynolds. He was instructed in his art by Fuller and Zoust, but he adopted Vandyck as his model, and painted much in the style of Lely; his draperies were admirable. Riley was a modest and unassuming man, and excessively diffident and distrustful of his powers. 'With a quarter of Sir Godfrey's vanity,' says Walpole, 'he might have persuaded the world he was as great a master.' And the same writer observes, that his 'talents while living were obscured by the fame rather than by the merit of Kneller, and depressed since by being confounded with Lely, an honour unlucky to his reputation.'

Upon the death of Sir Peter Lely, Riley came into general notice, and obtained the patronage that he merited. He was introduced to Charles II., and painted his portrait, who said, upon seeing it, 'Is this like me? Then, odd's fish, I am an ugly fellow,' which greatly disconcerted the modest painter. He painted also the portraits of James II. and his queen, Mary of Modena; and after the Revolution in 1688, he was appointed state painter to William and Mary, whose portraits he also painted.

Riley's master-piece is reckoned the portrait of the lord-keeper North, at Wroxton; and amongst his most successful performances are mentioned also the portraits of Bishop Burnet and the celebrated Dr. Busby, master of Westminster school. Riley died in London, of the gout, 1691, in the forty-sixth year of his age. His property, which, according to Walpole, amounted to only 800*l.*, came to his scholar Richardson, who had married his niece.

RI'MINI. [Forli, Province of.]

RI'MULA, the name given by Defrance to a genus of testaceous mollusks founded on a minute species of the genus *Emarginula* of authors, which has a fissure approximating to the margin, but not arriving at it. [Cervicobranchiata, vol. vi., p. 444.]

RIMULI'NA. [Foraminifera, vol. x., p. 347.]

RING. [Annulus.]

RING DOVE, one of the English names of the *Ring Pigeon*, *Wood Pigeon*, *Cushat* or *Queest*, *Columba Palumbus*, Linn.; *Ramier* of the French; *Colombaccio*, *Palombo*, *Piccione da Ghianda* of the Italians; *Ringeltaube* of the Germans; *Ysguthan* of the Antient British. The term *Ring Dove* is also applied to the *Collared Turtle*, *Columba risoria*, Linn.: *Tourterelle à collier* of the French; *Lachtaube* of the Germans. [Columbidæ, vol. vii., pp. 370, 373.]

RING OUZEL. [Blackbirds, vol. iv., p. 478.]

RINGENT, a form of the corolla of plants, so named from the supposed resemblance to the snout and mouth of some animal. The petals are irregular and gaping. The natural order Lamiaceæ possess this form of corolla.

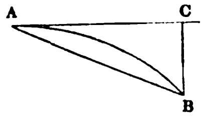
RINGTAIL, the English name of the female of the *Hen Harrier*, *Circus cyaneus*. [Falconidæ, vol. x., p. 183; Harrier (Ornithology).]

RINGTAILED EAGLE, a *Golden Eagle* in its youthful plumage. [Falconidæ, vol. x., p. 173.]

RINGWORM is the term applied to many cutaneous eruptions, and more particularly to those on the head. It is not now possible to determine to which of these the name was first applied; but it is probable that the species of herpes which appear in the form of rings were thus designated, especially that which nosologists call herpes circinatus. This disease is still often called ringworm, when it appears upon the forehead or scalp; but the same name is still more generally applied to the different forms of porrigo, especially P. larvalis and P. scutulata. The descriptions of the diseases thus confounded under this name will be found in the articles Herpes and Porrigo.

RINGS, COLOURED. Sir Isaac Newton, in his 'Treatise on Optics,' first supplied a careful examination of the coloured bands which are familiarly seen in soap-bubbles of sufficient tenuity, in thin plates of mica, and generally in any transparent plate of small width, whether bounded by denser or by rarer media. In explanation of these phenomena he invented his ingenious theory of 'Fits of easy transmission and of easy reflexion of light.' The explanation given by the undulatory theory is founded on the doctrine of the interference of the luminous waves.

Newton adopted an accurate method for discovering the relation between the thickness of the medium and the colours of the bands produced. Thus, by geometry, the distance of any point B of a circular arc from a tangent AC, is equal to the square of the chord AB divided by the diameter of the circle. When the latter is great in comparison of the arc AB, we may then substitute the tangent AC for the chord. Now, if we place together a convex lens and a plane glass, the perpendicular section taken through the point of contact of this system is evidently that in our figure. The point of contact A is the centre of the coloured rings: AC, being the radius of one of them, is easily measurable, and hence BC (the thickness of the interposed stratum of air) becomes known.



From the above it is evident that a convex lens of considerable focal length (about ten feet will answer) is to be preferred, inasmuch as the diameters of the rings enlarge, for a constant value of the thickness BC, in proportion to the square of the radius of the lens; the bands, being then greatly enlarged, may be more accurately examined and measured.

Suppose white light to be incident, the point of contact A will transmit it, and consequently appear black, but the light which passes through the small interval between the glasses will be decomposed, and form coloured rings having A for centre, each band having a gradation of colours from its interior to its exterior border, in the following order, viz.:—

	First.	Second.	Third	Fourth.
Rings.	Black	Purplish Violet	Purple	Dull Green
	Faint Blue	Blue	Blue	Pale Pink
	Bright White	Green	Bright Green	Red
	Yellow	Strong Yellow	Yellow	
	Orange	Crimson-Red	Pink	
	Red		Crimson	

In the fifth, sixth, and seventh, the colours are green and pink, with a middle white in the fifth, but they are now faint colours, and gradually become invisible.

By the calculation above explained Newton found the intervals BC between the plates in the succession of the darkest parts of the several rings to be as the numbers 0, 2, 4, 6, &c., and those corresponding to the brightest parts, as the odd numbers 1, 3, 5, &c., that corresponding to the brightest part of the first ring being only 178,000th part of an inch. Hence conversely the interval may be computed by observing the colour and the number of the band, for these intervals are constant whatever may be the curvature of the glass or glasses (if two lenses are used). The contact should be made as perfect as possible by pressure. Fringes may be similarly formed by laying a prism on a plane glass. The rings enlarge when seen obliquely, the interval for a given colour varying as the cosine of the angle of incidence. The constant co-efficient of this cosine (as compared with perpendicular incidences) is $\frac{1+106\,\mu}{107\,\mu}$, μ beng the index of refraction.

If homogeneous light of any colour be used, the rings of light then produced are all of that colour, intercepted by bands absolutely black. The colours, as given in the above table, when the light is white, being the result of superposing the different systems of rings, belong to the various homogeneous rays of the prismatic spectrum which constitute white light.

If we place the glasses between the eye and the source of light, so that the rings may be viewed by that portion of it which is transmitted, we find, as might be expected, that the colours are now complementary to those visible by reflected light. Colours are said to be complementary when their mixture produces white light.

The colours of soap or other liquid bubbles are produced in the same way, and at the same thickness as those in the case detailed above. In that case we had the rarer medium between the denser; here the denser is between the rarer. The rings commence at the top of the bubble, because there it first grows sufficiently thin.

The undulatory theory, upon admitting the loss or gain of half an undulation in the interference producing these rings, gives a satisfactory explanation of all the phenomena of coloured rings, but which contains analytical investigations of an abstruse nature.

Rings or fringes, such as those denominated Grimaldi's fringes, are also formed by the interferences attendant on the inflexion of light by the edges of opaque bodies, for which see DIFFRACTION.

RINGS, FAIRY, is a name given to certain spots which are observed amongst grass in fields, and which are characterised by being more luxuriant than the surrounding herbage. They are of two kinds: either an entire knot of grass is more luxuriant than the rest, or the luxuriant grass grows in a circle or the segment of a circle around a comparatively barren spot. The name of fairy rings was originally given to these spots because they were supposed to be the places where the little fairies held their nightly revels. Recently a better cause has been assigned for their origin. They are now known to be those portions of the surface on which a species of fungus has grown, which by dying has afforded nutriment for the grass on the spot; and as the fungus grows in this particular place on account of something favourable to its development, it continues year after year to extend itself beyond the small circular space to which it was originally confined; but as the grass in the centre loses the stimulating influence of the decayed fungus, this part becomes comparatively barren, and thus the ring of luxuriant grass keeps on extending for many years, till the earth, no longer affording the circumstances necessary to the development of the fungus, it dies. There are several species of fungus that produce this effect. It was first noticed by Dr. Withering as occurring with the *Agaricus oreades;* but the common mushroom (*A. campestris*), the gigantic puff ball (*Bovista gigantea*), and many others may be seen in the act of forming these circles. It is very probable that most of the large fungi would form these rings during their growth, provided the entire surface of the earth by which they were surrounded afforded the circumstances necessary to their growth.

RIO DE JANEIRO. [JANEIRO.]

RIOBAMBA. [ECUADOR, p. 267.]

RIOM, a town in France, capital of an arrondissement in the department of Puy de Dôme, 225 miles south-south-east of Paris, by the road through Fontainebleau, Montargis, Nevers, and Moulins, and 7 miles north of Clermont-Ferrand.

This town was antiently the chief town of the duchy of Auvergne, erected by King Jean II. in 1360, in favour of his son the duke of Berri: its prosperity dates from this epoch.

Riom stands on a small elevation in the rich plain of the Limagne of Auvergne, near the little river Ambène, which flows by the Lachau and the Morges into the Allier. The town is surrounded by a boulevard planted with trees, and lined, toward the country, with houses of modern erection, which shut out the beautiful view from the boulevard. The interior of the town consists of several streets; the two principal cross each other near the centre: these are wide and handsome, but not quite straight; the other streets are inferior all are very ill paved with lava and basalt, and some are adorned with fountains. The houses are almost universally built of lava from the quarries of Volvic, a small town three or four miles west of Riom: the dark colour of the stone gives to the place a sombre appearance. The principal public buildings are the church of Saint Amable, remarkable for its elegant dome; La Sainte Chapelle, a beautiful Gothic building; the court-house (palais), another fine Gothic building; the clock-tower, from the summit of which there is a charming prospect of the surrounding country; and the central prison or house of correction, large, lofty, secure, and well ventilated.

The population of the town in 1831 was 11,992 for the town, or 12,379 for the whole commune; in 1836 it was 11,473 for the commune, showing the serious diminution of 906 persons in five years. The trade of the place is not very considerable: the chief articles of manufacture are candles, and preserves of apricots, apples, &c. (which, together with the fruits of the neighbourhood, are sent to Paris), liver of antimony, some linens and cottons, brandy, and leather. The chief articles of trade, besides the above, are corn, hemp, coarse linens, walnut-oil, and hempseed-oil. There are four fairs in the year.

The importance of Riom is chiefly derived from its tribunals, the business of which is augmented by the propensity of the people of Auvergne to litigation. It has a Cour Royale, the jurisdiction of which extends over the departments of Allier, Cantal, Haute Loire, and Puy de Dôme; a subordinate court of justice, and a tribunal of commerce; together with some fiscal government offices. There are also a high school, with a cabinet of natural philosophy; an hospital, two almshouses, a poorhouse, and a theatre.

The arrondissement of Riom has an area of 885 square miles, and is divided into thirteen cantons, or districts, each under a justice of the peace: it comprehends 130 communes. The population in 1831 was 146,495; in 1836, 151,456.

RIOT. A riot is a misdemeanour at common law. The definition of it given by Hawkins, and which appears to have been very generally adopted without much alteration by subsequent writers, is 'a tumultuous disturbance of the peace by three persons or more, assembling together of their own authority, with an intent mutually to assist one another against any who shall oppose them in the execution of some enterprise of a private nature, and afterwards executing the same in a violent and turbulent manner, to the terror of the people, whether the act intended were of itself lawful or unlawful.' The assembling together therefore in a case where the law authorises parties to meet and use force in concert, as for the purpose of suppressing rebellion or opposing the king's enemies, or as part of the posse comitatus, will not constitute a riot. Neither will a sudden quarrel occurring among a number of persons who have met together at a fair, or on similar occasions, constitute a riot. But if on the occasion of a meeting, lawful in itself, some act of violence in disturbance of the peace is afterwards proposed, and executed in concert by those who are assembled, they will be guilty of a riot. The enterprise must be of a private nature, not necessarily relating to an individual, but still having in view some minor and special, and not a general public object. Thus it may concern the interests or disputes either of some one person or of the inhabitants of some town or district. The object may be, for instance, to redress a grievance said to be suffered by such person, or to pull down inclosures on lands where the inhabitants claim a right of common. But if the enterprise is for the purpose of redressing grievances generally throughout the kingdom, or to pull down all inclosures, the offence is not a riot, but amounts to a levying of war against the king, and the parties engaged in it are guilty of high treason.

Hawkins asserts that there must be some circumstance of violence either to the person of a man or to his possessions; but it has been otherwise decided by Sir James Mansfield, C. J. (2 *Camp.*, 368). Violence however, if not of actual force, yet in gesture or language, and of such a nature as to cause terror, is a necessary ingredient in the offence of riot. The lawfulness of the enterprise operates no further than as justifying a mitigation of the punishment. It does not in any way alter the legal character of the offence. All parties present at a riot who instigate or encourage the rioters, are themselves also to be considered as principal rioters.

Two minor offences of rout and unlawful assembly, which are similar to riot, are generally treated on under that head.

A *rout* is where parties have commenced but not accomplished an enterprise, and in such a way that if the enterprise had been executed, they would have committed a riot.

It is an *unlawful assembly* when great numbers of people meet together with such circumstances of behaviour as to raise the fears of their fellow-subjects, and to endanger the public peace. An assembly therefore of a man's friends to defend his person against violence threatened to him if he appear in a public place is unlawful, as such conduct tends to produce a breach of the peace. But an assembly in a man's own house to protect him while there, or to defend the possession of it, is not considered an unlawful assembly. At common law the sheriff and all peace officers are bound themselves to make every effort and to command all others to assist them to suppress a riot. It seems also that where the emergency is great and immediate, private persons on their own authority may act, and even use arms for the same purpose. On such occasions it has not been usual for the military to take any part except in the presence and under the direction of a civil authority. They are not however by law disqualified for any duty or relieved from any responsibility which under the same circumstances attach to other classes of their fellow-subjects.

Various acts of parliament have been passed for the purpose of giving authority to magistrates and others for the purpose of suppressing riots, and restraining, arresting, and punishing rioters. These are collected and commented upon by Hawkins (1 *P. C.*, b. i., c. 65) and Burn (5 vol., 'Riot,' &c.). The most important is 1 Geo. I., st. ii., c. 5, commonly called the Riot Act. By that statute it is provided that 'if any persons to the number of twelve or more, being unlawfully, riotously, and tumultuously assembled together to the disturbance of the public peace, shall continue so assembled for the space of an hour after a magistrate has commanded them by proclamation to disperse, they shall be considered felons.'

The form of proclamation is given in the Act, and is as follows:—'Our sovereign lady the queen chargeth and commandeth all persons, being assembled, immediately to disperse themselves, and peaceably to depart to their habitations or to their lawful business, upon the pains contained in the Act made in the first year of King George for preventing tumults and riotous assemblies.

'God save the Queen.'

This is directed to be read with a loud voice and as near as possible to the rioters; no word must be omitted. Persons who do not disperse within the hour may be seized and apprehended by any magistrate or peace-officer or any private person who has been commanded by a magistrate or an officer to assist. In case of resistance, those who are attempting to disperse or apprehend the rioters will be justified in wounding or killing them. It is felony also to oppose the reading of the proclamation; and if the reading should be prevented, those who do not disperse are still guilty of felony, if they know that the reading of the proclamation has been prevented.

A prosecution under this Act must be commenced within a year after the offence has been committed. By the 7 & 8 Geo. IV., c. 30, s. 8, rioters who demolish or begin to demolish a church or a chapel, a dwelling-house, or any other of the various buildings or machinery mentioned in that Act, are to be considered as felons. By 7 & 8 Geo. IV., c. 31, provision is made for remedies against the hundred in case of damage done by rioters.

By that Act compensation may be recovered by action against the hundred for any injury done to buildings, or furniture, &c. contained in them, to the amount of 30*l.* Where the damage done does not amount to 30*l.*, inquiry may be made on oath of the claimant, or other witnesses, before justices at a petty sessions, who are authorised to make an order for payment of damages and costs. An inhabitant of the hundred is made a competent witness for the defendants. In order to recover in either of these proceedings, it is necessary to show that a riot has been committed; and in case the building, &c. has not been demolished, to show that the rioters had *begun to demolish* it; that is, that their intent was to demolish, although from some reason that intent has not been carried into execution. Unless this intent is proved, the party is not entitled to compensation, however great damage may have been done; and if the intent did exist in the minds of the rioters, compensation is still claimable, however slight the damage. If the rioters have been interrupted in their proceedings, it will be left to the jury, or it will be for the justices to say, whether, without such interruption, a demolition would have been effected. But if the rioters have voluntarily retired without effecting a demolition, or if, though disturbed, their intent, from other circumstances, appears to have been directed towards some other object, as for instance to compel persons to illuminate, &c., the parties injured will have no remedy under the statute, as it appears that there was no intent to demolish.

The action must be commenced within three months after commission of the offence; and to entitle the party injured to bring an action, he, if he had knowledge of the circumstances, or the party in charge of the property, must, within seven days after the injury done, go before a magistrate and give on oath all the information relative to the matter which he possessed, and also be bound over to prosecute the offenders.

With respect to unlawful assemblies of a seditious character, various provisions are enacted by 39 Geo. III., c. 79, and 57 Geo. III., c. 19; and in reference to those for the purpose of training to the use of arms, by 60 Geo. III., c. 1.

(Hawkins, *P. C.*; East, *P. C.*; Burn's *Justice*, vol. 5, 'Riot,' &c.; Russell, *On Crimes*.)

RIPON, an antient borough, parish, market-town, township, and bishopric, is in the wapentake of Claro in the West Riding of the county of York. It gives its name to an extensive liberty which has its peculiar courts. It is 208 miles north-north-west of London, 27 miles north of Leeds, and 24 miles north-west by west of York.

The parliamentary borough comprises the township of Ripon and a part of the township of Aismunderby-cum-Bondgate, including a population of 5735. It returns two members to parliament. The municipal borough has the same extent: the corporate body consists of four aldermen and twelve councillors, with a commission of the peace. Till lately the liberty of Ripon contained 29 townships, parishes, and chapelries, 43,490 acres, and a population of 13,222; but by a statute of 1st Victoria, five parishes and townships situated in the North Riding, and comprising a population of 1293 and 8990 acres, were separated from this liberty. Besides extending over the liberty of Ripon, the parish is partly in the lower division of Claro wapentake, where it has 18,391 acres, and a population of 3252. The bishopric of Ripon was created, in 1836, out of the large dioceses of York and Chester; it extends over a great part of the more populous districts of the West Riding, and over the liberty of Richmondshire in the North Riding.

According to the first historical notice of Ripon, Eata, abbot of Melrose, founded a monastery here in 661. A few years after, Aldfrid, king of Northumbria, gave this monastery to Wilfred, archbishop of York. Under his auspices both the town and the church flourished, and received many marks of royal munificence. He died in the year 711, and was buried in his monastery. The town is said to have suffered much by the incursions of the Danes in the ninth century, but it was made a borough by Alfred the Great. King Athelstan granted the monastery various immunities, among which was the privilege of sanctuary, which it possessed till that privilege was wholly abolished in England. The town suffered reverses in the wars against the Northumbrian Danes, in the devastations of the Normans, and in the invasion of Robert Bruce. Henry IV. fixed his residence here when he was driven from London by the plague; and in the civil war under Charles I. the town was occupied by the parliamentarians under Sir Thomas Mauleverer, who was expelled by the royalists commanded by Sir John Mallory.

The collegiate church of Ripon, commonly called the Minster, now the Cathedral, is dedicated to St. Peter and St. Wilfred; it is parochial as well as collegiate. Rickman speaks of this edifice as 'containing various parts well worthy of attention, particularly its west front, which is a very fine specimen of bold early English, and, except the battlements and pinnacles, without alteration.' The first stone of the present building was laid in 1331, but the choir was probably not finished till 1494. It is said to be one of the best-proportioned churches in the kingdom. Its length from east to west is 266 feet 5 inches, the transept is 132 feet long, the nave and aisles 87 feet broad, and the choir and aisles 66 feet 8 inches broad. It has two uniform towers at the west end, each 110 feet high, besides the great tower, called St. Wilfred's tower; each of these towers originally supported a spire of wood covered with lead. Under the chapter-house is a vaulted charnel-house, which is much visited by tourists; it contains an immense collection of human remains in good preservation, piled in regular order round the walls.

Trinity Church was built and endowed in 1826, at a cost of 13,000*l.*, by its first incumbent, the Rev. Edward Kilvington. The other places of worship are three Methodist chapels and an Independent chapel. St. Mary Magdalene's Hospital, founded by Archbishop Thurstan in 1144, is now divided into six dwellings for poor widows, who receive a small annual stipend. A chapel is attached to this building. In the hospital of St. Anne eight poor women are similarly maintained. The hospital of St. John the Baptist is occupied by two poor women, and the chapel formerly attached to it is now a national school with 200 boys. Jepson's Hospital is for the education and maintenance of poor orphan boys; the funds have been increased by a small bequest, and now amount to nearly 180*l.* a year, which supports and educates ten boys. There are also a few minor charities. The free grammar-school was founded in 1546 by Edward V., and afterwards endowed by Philip and Mary. Its income is at present 370*l.* per annum. The property is let at low rents on leases of 21 years, renewable every seven on payment of certain fines; these fines amounted in 1811 to 1069*l.*, and in 1818 to upwards of 1200*l.* The master is allowed to take boarders, and other boys not on the foundation. The school is free, for Latin, Greek, and English grammar, to the sons of all residents; a charge is made for writing and arithmetic. There is a girls' national school, which was built by Miss Lawrence of Studley; this and the boys' national school are supported by subscriptions. The Public Rooms at Ripon comprise a Dispensary, a Mechanics' Institute, a Subscription Library, and a News-room; the edifice thus occupied was erected in 1834, at a cost of 2500*l.*, in 200 proprietary shares; an extensive pleasure-ground and garden is attached.

Ripon was once celebrated for its manufacture of spurs, which were in such high repute, that 'as true steel as Ripon rowels' became a proverbial expression to denote honesty and courage; it was also noted for its woollen manufactures, which however left the banks of the Ure for those of the Aire and Calder some centuries ago. The present manufacture is chiefly saddle trees; it also produces linens and malt. The market-place is a spacious square, surrounded chiefly by shops and good houses; in the centre stands an obelisk 90 feet high, which is surmounted by the arms of Ripon, a bugle-horn and a spur-rowel. This obelisk was erected by William Aislaby of Studley, who represented the borough for sixty years in parliament. The fairs of Ripon are six in number, and are chiefly for leather, cattle, and cloth. On the south side of the market-place is the Town-hall, built in 1801, at the cost of Mrs. Allanson of Studley; it comprises a suite of rooms for the magistrates, assembly-rooms, and other commodious apartments. Four beautiful Ionic columns in front support a handsome pediment. The streets of Ripon are neither spacious nor regular, but they are generally clean. The Ure navigation was brought up to the town by means of a short canal in 1767. The fine domain of Studley is situated about three miles from Ripon, and includes the venerable monastic remains of Fountain's Abbey.

(Allen's *Yorkshire*; and White's *History and Gazetteer of the West Riding*.)

RIPPERDA, JOHN WILLIAM, Baron, afterwards **DUKE OF**, a descendant from an antient and honourable Spanish family, which had settled at Groningen during the period that the Low Countries were attached to Spain, was born in that district in the latter part of the seventeenth century. His father being a Roman Catholic, young Ripperda was educated in the Jesuits' college at Cologne. After greatly distinguishing himself in the course of his education, Ripperda returned to the United Provinces, and having soon after entered the Dutch army, served during the whole of the war of the Succession, and rose to the rank of colonel. He then married the heiress of very considerable property, in order to obtain which he first renounced the faith of his fathers. Aspiring to political distinction, he eagerly sought a seat in the States-General, and was returned towards the end of the war as deputy for his own province. In 1715 the States appointed him envoy extraordinary to the court of Spain, with instructions to arrange definitively a system of commercial intercourse between the two powers. On his arrival at Madrid, Ripperda immediately attached himself to Alberoni, the all-powerful minister of Philip V. [ALBERONI], whom he assisted with memorials and plans of improvement for the commerce and finance of Spain, and whose protection he secured. During his residence at Madrid, Ripperda carried on several intrigues by no means creditable to his character either as an ambassador or a man: for whilst conducting the negociations of his native country, Holland, he maintained a secret correspondence with the emperor, and was also guilty of a most disgraceful transaction towards Mr. Doddington, the English minister, in whose pay he seems to have been, whilst he secretly informed Alberoni of all his projects.

In the meantime Ripperda rose high in favour both with Philip and his minister. By his exertions fifty master-workmen from Holland were induced to settle in Spain, and to establish extensive cloth manufactures, first at Azeca, and afterwards at Guadalaxara. Having some time after applied for some recompense for his services, he was answered that the king of Spain could never employ in any high or responsible office a person attached to the Protestant faith. Accordingly, in March, 1718, Ripperda quitted the Spanish capital and returned to Holland. Having rendered a full account of his mission, of which the States expressed their approbation, he then formally resigned the office which he held, and set out once more for Madrid, and proceeded thence to Aranjuez, where, soon after his arrival, he made his abjuration, receiving as a compensation for his losses the appointment of superintendent-general of the royal manufactories at Guadalaxara, with a considerable pension and extensive grants of land. The fall of Alberoni, which was hastened by Ripperda, opened to this ambitious man the way to power, and he was accordingly entrusted, in 1725, with the formation of a secret treaty with the emperor. To reward his services in that memorable transaction, he was soon after created duke, and raised to the dignity of grandee of Spain.

On his return to Madrid, Ripperda was appointed secretary of state in the place of the marquis of Grimaldi. Having succeeded shortly after in gaining the entire confidence of Philip, he was raised to the post of prime minister. His administration however was not of long duration. Unable to fulfil the secret engagements entered into with the house of Austria, or to accomplish the vast schemes laid down by the treaty of Vienna, such as the recovery of Gibraltar by force of arms, and the seating of the Pretender on the throne of England, schemes which the exhausted state of the Spanish treasury and the menacing attitude assumed by Great Britain compelled him to relinquish, Ripperda fell into disgrace with the Spanish monarch.

On the 25th of May, 1727, he was arrested at the house of Colonel Stanhope, where he had taken refuge, and was sent to the fortress of Segovia, where he remained in close confinement, until, having eluded the vigilance of his keepers, he made his escape, and arrived safely in Lisbon, where he embarked for Cork. After spending some time in England, he set sail for his native country in 1731, and settled at the Hague. Whilst there he became acquainted with an envoy from the court of Marocco, of the name of Perez, who was a Spanish renegado, and who, perceiving the violent hatred which Ripperda bore to the Spaniards, and his love of adventure, induced him to try his fortunes upon the shores of Africa. Ripperda accordingly set sail for Tangier, and was well received by the emperor of Marocco (Muley Abdallah), who gave him the command of an army destined to repel a threatened invasion from Spain. Ripperda was however defeated before Oran, which city fell into the hands of the Spaniards in 1732.

About this time Ripperda is said to have abandoned the Roman Catholic creed, and to have embraced the Mohammedan religion, taking the name of Othmán Pasha. He lived for some time at Marocco, surrounded with all the gratifications and luxuries that wealth could supply, and then removed to Tetouan, where he remained until his death in 1737.

It is said that some time previous to his death he believed himself inspired, and endeavoured to propagate a new religion—a mixture of Christian, Jewish, and Mohammedan doctrines, which however had no followers. Shortly after the death of this extraordinary man there appeared at Amsterdam an account of his life and adventures, under this title: 'La Vie du Duc de Ripperda, par M. P. M. B.,' 8vo., Amst., 1739. The same work was translated into English, by John Campbell, and published as 'Memoirs of the Basha Duke of Ripperda,' London, 1739, 8vo. There is also a Spanish translation of it, Madrid, 1748

RIPPLE-MARK. In geology, the undulations on the surface of many rocks, which resemble the ridges and hollows left on mud and sand by the small waves of water, are thus termed.

The progress of geological induction has given an unexpected importance to the study of these undulations; for it is now certain that the right understanding of their origin is a very necessary element in reasoning on the deposition of stratified rocks and the displacements of the antient bed of the sea.

The formation of small ridges and furrows, under the influence of water which ripples or undulates in small waves, may be conveniently witnessed and studied on the shores of comparatively quiet seas, on the margins of lakes, or along the sides and shallow beds of rivers. The 'ripple-mark' thus produced is more or less permanent, according to the nature of the sediments on which it is impressed, and the circumstances which accompany and succeed the withdrawal of the water which formed it.

Loose coarse sand easily receives impressions from the superfluctuating water, which momentarily change under the varying influences of the waves: muddy sediments are less easily moulded, but the forms are less fleeting. It happens often that on the gradual retreat of the tide from broad muddy surfaces like those in the bay of Morecambe, or along the shores of the Thames, the small rippling waves of the ebbing tide leave marks sufficiently durable to allow of being indefinitely preserved, if by any gradual operation some new sediments were gently overlaid.

A very small ripple leaves its mark on the subjacent sand or mud at only very small depths: larger waves are felt to a greater depth; and apparently the depth at which ripple-marks are formed may be judged of, within moderate limits of error, by the breadths of the ripple-marks. Wherever then we find among marine stratified rocks or sediments, of whatever date, undoubted ripple-marks such as shallow waters leave, those deposits contain clear proof of their having been formed at small depths; and when, as frequently happens, these are seen to be covered by other sediments hundreds or thousands of feet in thickness, the conclusion is just that in those situations the antient sea-shore underwent a great subsidence, or the ocean-level experienced a great rise, after the formation of those now buried ripple-marks. There has been in those situations a change of the level of land or sea. Now we find ripple-marked strata among the rocks of every geological age. As examples, we mention, among strata lower than the mountain limestone, the fossiliferous rocks ('grauwacke') near Kirby Lonsdale, and near Linton in North Devon; in the sandstones of the mountain limestone group, under Penyghent in Yorkshire; in the sandstone of the coal-formation at Elland in Yorkshire; in the sandstones of the new red-sandstone formation at Storeton near Liverpool; in the sandstones of the oolitic rocks near Scarborough and near Stamford; in the Wealden deposits at Horsted.

In most cases ripple-mark is found on sandstones or indurated clays of fine grain and frequent lamination, and it is most distinct on surfaces where a change of deposit happens, as where sandstones alternate with thin clay partings. Rarely, as in the Storeton quarries, impressions of quadrupeds accompany the ripple-mark; and it is even thought that marks of rain are preserved thereon.

It is unnecessary to lengthen this notice by pointing out the obvious importance of the careful study of a phenomenon which is frequent among the stratified deposits, and on which remarkable generalizations partly, if not principally, depend. By careful attention to the evidence which is left on the surfaces of rocks, we may learn the depth and some other circumstances of the water which covered them at the time of their deposition; and come to understand how, by successive steps or gradual depression, the sea-bed was lowered, in relation to the ocean-level, hundreds, or even thousands of feet, locally or extensively, so as to allow of the successive accumulation of new sediments containing the remains of new races of marine animals and land-plants, without requiring the aggregation of laminated clays, sands, and gravels, at depths beyond the reach of littoral agitation, or the profuse abundance of mollusca and polypiaria, in regions of the sea where enormous pressure and deficient light seem to forbid their very existence.

See for a general view of the causes of ripple-mark made by water and wind, and examples of the latter circumstance, Mr. Babbage's *Ninth Bridgewater Treatise*. Further notices bearing on the subject will be found in Playfair's *Huttonian Theory*; Lyell's *Principles of Geology*, vol. iv.; and De la Beche's *Theoretical Researches*.

RI'SCULUS. [PŒCILOPODA, vol. xviii., p. 302.]

RISK. In the theory of PROBABILITIES the risk of loss or gain means such a fraction of the sum to be lost or gained as expresses the chance of losing or gaining it: thus an even chance of losing 40*l.* is considered as a positive loss of one-half of 40*l.*, or of 20*l.*; and 2 to 1 for gaining 60*l.* is counted as two-thirds of 60*l.*, or 40*l.* If both these risks were encountered at the same time, the whole transaction would be considered as a gain of 40*l.*—20*l.*, or 20*l.*, since this is the sum which would be netted by every such transaction in the long run, and one with another.

The following is the method of ascertaining the effect of the division of risks. Let there be an adventure in which the chance of success is p, and that of failure $1-p$. Let failure produce the loss £n and success the gain £m: then $pm-(1-p)n$ is the result of every such transaction one with another. Let this last be called M; it is required to estimate the probability that in s transactions the average effect (gain or loss, according as M is positive or negative) shall lie between $M+l$ and $M-l$. Calculate the square root of s divided by $2p(1-p)$; multiply this square root by l, and divide the result by $m+n$. Take the table in MEAN (using it as in PROBABILITY, p. 27), let the last result be A, then the corresponding B is the probability required. [WAGER; WEIGHT OF OBSERVATIONS.]

RI'SSOA, M. de Freminville's name for a genus of small testaceous trachelipods (gastropods of Cuvier), founded on some small shells observed by the well-known M. Risso of Nice, and described by M. Desmarest in 1814 in the 'Nouveau Bulletin de la Societé Philomathique.'

Lamarck placed the few species known to him among the *Melaniæ*, but without distinction. Delle Chiaje made known the animal structure of a Mediterranean species in his memoirs on the *Invertebrata* of the Neapolitan Sea; and Philippi recorded its generic characters in his 'Enumeratio Molluscorum Siciliæ,' from observations made upon two other Mediterranean species.

Generic Character.—Animal with a subtriangular foot, truncated anteriorly, pointed posteriorly. Head proboscidiform, with a subulate tentacle on each side, at the external base of which the eye is placed on a little convexity; mouth prolonged into a short and truncated proboscis.

Shell elongated, turriculate, sometimes short and subglobular; aperture oval, semilunar, subcanaliculate, having the right lip thickened, and nearly always projecting forwards, and arched longitudinally; *operculum* horny, closing the aperture exactly.

M. Deshayes acknowledges the difficulty of fixing the relations of *Rissoa*; but, upon a comparison of the characters observed by Delle Chiaje and Philippi with those of *Cerithium*, he thinks it evident that *Rissoa* approaches the *Melaniæ* as closely as the *Cerithia*, and that it may be considered as intermediate between those two genera. In the last edition of Lamarck, he has placed it between *Melania* and *Melanopsis*. M. de Blainville had previously placed the genus in his family *Ellipsostomata*, between *Melania* and *Phasianella*. M. Rang arranged it between *Melania* and *Littorina*, among the *Turbinés* of De Férussac, observing that he does not think that *Rissoa* can be admitted as a genus, though it may well hold the rank of a subgenus, in which case it may take its place at the side of the *Melaniæ*, and near the genus *Paludina* of De Férussac.

M. de Blainville divides the genus into the following sections:—

A.

Turriculated and Ribbed.

Example, *Rissoa acuta.*

B.

Subturriculated and Ribbed.

Example, *Rissoa costata.*

C.

Subturriculated; perfectly smooth.

Example, *Rissoa hyalina.*

D.

Subglobular.

Example, *Rissoa cancellata.*

The same divisions are adopted by M. Rang.

Seven species only appear to have been known up to the time (1830) when M. Michaud published, in his illustrated memoir, sixteen new species; and to these are to be added the thirteen described and figured by Philippi. M. Deshayes, in his Tables, gives the number of recent species as twenty-three, and of fossil (tertiary) twenty-two, of which last two, *Rissoæ lactea* and *cochlearella*, are recorded as both living and fossil (tertiary). In the last edition of Lamarck, the number of recent and fossil species published by M. Deshayes amounts to forty-four; but he states that there are other materials for this genus, and that his own collection alone contains more than eighty species, living and fossil.

M. Deshayes divides the *Rissoæ* into three groups: in the 1st he places the subglobular species which approach the *Turbines* and *Littorinæ* (*The Turbiniform*); in the 2nd, those which are elongated, and whose aperture approaches that of the *Melaniæ* (*The Melanioids*); and 3rd, those whose semilunar aperture is subtruncated at the base, and which are approximated to the *Cerithia* (*The Cerithiform*).

Localities.—The Mediterranean Sea, principally; but species are recorded from the coasts of Great Britain and France, and from the East Indian Seas and Senegal.

Mr. Th. Müller (*Synopsis*) seems to be of opinion that *Pasithea nigra, Turbo minutus,* and *Acteon trifidus* of Totten, belong to this genus.

Fossil Rissoæ.

M. Deshayes, in the last edition of Lamarck, observes that for a long time *Rissoæ* were found fossil in the tertiary strata only; but that Mr. James Sowerby, in his 'Mineral Conchology,' has published four species from the great oolite; whilst it is remarkable that no species of this genus have been found in the formations between the great oolite and the tertiary strata: it is to be presumed, he adds, that hereafter they will be found in those beds.

We have seen that the number of fossil *Rissoæ* (including two living species) found in the tertiary formations is given by M. Deshayes in his Tables as twenty-two. The two species recorded as both living and fossil are *Rissoæ lactea* and *cochlearella*. In the last edition of Lamarck, *R. lactea* is not noted as occurring in a fossil state; nor do we find any mention of *R. cochleurella*, excepting under the head of *Rissoa striata*, where it is stated that this species, described by MM. Quoy and Gaimard, in the *Voyage of the Astrolabe*, bears much resemblance to living individuals of *R. cochlearella*; but *Rissoæ cancellata, labiata, oblonga, costata, monodonta, pusilla, pulchella,* and *Bruguieri*, are all recorded as both living and fossil (tertiary). The number of named species which are fossil only, including the species from the oolite and *R. decussata*, in the same work, is eleven.

RITSON, JOSEPH, a poetical critic and antiquary of the eighteenth century, was born at Stockton in Durham, and some of his pieces were published there before he came to settle in London. He was by profession a conveyancer, with chambers in Gray's Inn, but being appointed deputy high bailiff of the duchy of Lancaster, he did little in his profession, living on the income which his office yielded him, and spending his time in literary pursuits. During the twenty years between 1782 and 1802, he poured the results of his studies and researches on the public in books in quick succession; yet not so rapidly that it can be said that they are carelessly executed, or that their contents are worthless. On the contrary, he appears to us to have been a most valuable member of the literary fraternity, and to have done perhaps more than any man to introduce a spirit of curiosity respecting our early poets, and of critical exactness in editing their remains.

The trifling works which he printed before he became settled in London need not be particularised; and the first work which we need to mention, and indeed the first work which brought him into any notice, was his 'Observations on the three first volumes of the History of English Poetry,' in a familiar letter to the author (Warton), 4to., 1782. This was the first serious attempt to call the attention of the public to the many inaccuracies and faults of that celebrated work; a bold and useful service, but dangerous to him who undertook it, as Warton had many and powerful friends, who could not bear to see him so roughly handled, even though they could not deny that almost every one of Ritson's strictures was just. However it must be owned that Ritson addressed himself to the work in a very unamiable spirit, and wrote like a man who was not much accustomed to the intercourse of refined society. The work has become, perhaps justly, a bye-word when men would speak of critical abuse. In the next year he published some 'Remarks on the Commentators on Shakspere,' which is to be distinguished from a larger work published by him in 1792, entitled 'Cursory Criticisms on the Edition of Shakspere published by Edmund Malone.' In 1783 he also published 'A Select Collection of English Songs, with an Historical Essay on the Origin and Progress of National Song,' of which a second edition was published by Mr. Park in 1813. In 1790 appeared his volume of 'Ancient Songs, from the time of King Henry III. to the Revolution,' reprinted in 1829. This is regarded as one of the most valuable of his works. In 1791 he published 'Pieces of Antient Popular Poetry,' from authentic manuscripts and old printed copies; in 1793, 'The English Anthology,' in three volumes; in 1794, a 'Collection of Scottish Songs,' and in 1795, the very remarkable poems of a forgotten poet, Minot, on events in the reign of Edward III., which have also been reprinted. In the same year he published his large collection of ballads on the exploits of 'Robin Hood,' with much prefatory matter, in which he cannot be said to appear to any great advantage. In 1802 he produced two works in this department of literature: the one, 'Antient English Metrical Romances,' in 3 vols. 8vo.; the other, 'Bibliographia Poetica,' a catalogue of English poets of the twelfth, thirteenth, fourteenth, fifteenth, and sixteenth centuries, with a short account of their writings, a work very imperfect, but to which succeeding writers in this department have been greatly indebted.

To enumerate however all the works produced by Mr. Ritson in his twenty years' literary career would carry out this article to an unreasonable extent. It may be sufficient to add that there are several small works of his under the denomination of Garlands, as the 'Bishopric Garland,' the 'Yorkshire Garland,' the 'Northumberland Garland,' and 'Gammer Gurton's Garland;' and also several tracts relating to his profession, and especially to the court with which he was more particularly connected. In 1802 he published 'An Essay on Abstinence from Animal Food as a Moral Duty.'

He died in September, 1803. Since his death several tracts have appeared attributed to him, and a collection of his correspondence has been published. Some account of his life was published by Mr. Hazlewood in 1824. He had through life the reputation of a surly critic, which his attack on Warton gained for him, and he was more shunned than courted by his literary contemporaries.

RITTENHOUSE, DAVID, was born on the 8th of April, 1732, near Germantown in Pennsylvania. His father, who was a farmer in that province, intended that he should follow the practice of husbandry, and being apparently in narrow circumstances, he could give him no other education than that which usually falls to the lot of persons who are engaged in such occupations.

But the elasticity of genius is often superior to the pressure of adverse fortune, and young Rittenhouse, before he was seventeen years of age, displayed a taste for mechanical and mathematical subjects; without books or instructors, he is said to have executed a wooden clock, and, similarly to what is related of Pascal, to have covered the ploughs and fences on his father's farm with geometrical figures. This exhibition of uncommon talent, joined to a conviction on the part of the elder Rittenhouse that the delicacy of his son's constitution would render him unfit for the labour of cultivating the ground, induced the father to procure for the youth the tools of a watch and mathematical instrument maker, and to dispense with his services in performing the duties of the farm. Grateful for this favour, the young man worked diligently with his hands during the day, and at night devoted a portion of the time which should have been passed in taking repose, to the prosecution of his studies. His success appears to have been extraordinarily great, for his biographers assert that, before the age of twenty, he was able to read the 'Principia,' and that he had discovered the method of fluxions, without being aware that this had been already done by Newton and Leibnitz. He also constructed two orreries exhibiting the movements of the planets and their satellites. These machines are said to be still in existence, one in the university of Pennsylvania, and the other in the college of Princeton.

In 1769, Mr. Rittenhouse was made one of a Committee appointed by the American Philosophical Society to observe the transit of Venus which was to take place in that year, and he was so fortunate as to witness the phenomenon in a temporary observatory which he built for the purpose. His observation and the calculations relating to it gained for him the approbation of the astronomers of Europe, and the title of Doctor in Laws was subsequently conferred on him. In 1779 he was named one of the commissioners for adjusting a territorial dispute between the states of Pennsylvania and Virginia; in 1786 he was employed in fixing the line which separates Pennsylvania from the state of New York, and in the following year he assisted in determining the boundary between New York and Massachusetts.

Dr. Rittenhouse was elected a member of the American Academy of Arts and Sciences at Boston, in 1782, and of the Royal Society of London, in 1795. In 1791 he succeeded Dr. Franklin as president of the American Philosophical Society, to whose 'Transactions' he contributed many papers, chiefly on astronomical subjects. In 1777 he was appointed treasurer of Pennsylvania, and this important office he held with incorruptible integrity till his resignation of it in 1789. During the American war, he is said to have fulfilled the duties of a patriot, and to have spoken and acted like a freeman; and in 1792 he received his last appointment, which was that of director of the mint of the United States. In this post his mechanical skill is said to have been highly useful; but in 1795 he was obliged to resign it from bad health, and, after a short but painful illness, he died on the 26th of June, 1796.

It is stated that, in private life, Dr. Rittenhouse exhibited every amiable virtue; that he was an excellent husband, father, and friend; and that, himself a stranger to high pretensions, he felt a strong attachment and esteem for those who cultivated and propagated science. A public eulogium was pronounced on him by Dr. Rush; and in 1813, a Memoir of his life was published by his relative, W. Barton, Esq., of Lancaster.

(*Encyclopædia Americana; Gent. Mag.*, Sept., 1796; *Monthly Mag.*, Oct., 1796.)

RITUAL (from *ritus*, in the sense of *consuetudo*), the book which directs the rites and ceremonies to be observed in celebrating divine service in any particular church.

RIVE DE GIER. [LOIRE.]

RIVER. In a legal sense rivers are divisible into fresh and salt-water rivers. Salt-water rivers are those rivers or parts of rivers in which the tide ebbs and flows. Rivers are also divisible into public or navigable rivers and private rivers.

The property in fresh-water rivers, whether public or private, is presumed to belong to the owners of the adjacent land; the owner on each side being entitled to the soil of the river and the right of fishing as far as the middle of the stream. But this presumption may be rebutted by evidence of special usage to the contrary. For instance, it may be shown that the property of the river is in one person, and of the adjacent land in another: or that one party owns the river and the soil of it, and another the free or several fishery of the river. If a fresh-water river between the lands of two owners gains on one side by insensibly shifting its course, each owner continues to retain half the river, and the insensible addition by alluvium belongs to the land to which it attaches itself; unless the lands of the proprietors on each side has been marked out by other known boundaries, such as stakes, &c. in the river. This part of the law as to the acquisition by alluvio, is stated by Bracton in the chapter 'De acquirendo rerum dominio' (fol. 9), and his statement both in substance and expression is taken from the *Digest* (41, tit. 1, s. 7), with which Gaius may be compared (ii. 70). But if the course of the river is changed suddenly and sensibly, then the boundaries of the lands will be, as they were before, in the midst of the deserted channel of the river. Special custom may also alter this general presumption of law. It is said that below Gloucester bridge the Severn is by common custom always held to be the boundary of certain manors, however suddenly or sensibly the course of it may be changed. Though fresh-water rivers are presumed to be the property of adjacent landowners, yet such owner cannot set up a ferry and demand a toll unless by prescription or by charter from the king.

In early times also the king by his prerogative might prevent all persons from fishing or fowling in any river until he had first taken his pleasure there. This was effected by directing a precept to the sheriff commanding him to cause all persons to abstain from approaching the banks. By the 16th chapter of Magna Charta the enjoyment of this prerogative was restricted to such streams as it had been exercised upon in the time of Henry I. Subsequently the custom was to name the rivers in the precept to the sheriff; among these was the Avon, at least that part which flows through Worcestershire. Eventually the prerogative fell into disuse. In those rivers which are navigable, and in which the public have a common right to passage, the king is said to have 'an interest in jurisdiction,' and this is so not only in those parts of them which are the king's property, but also where they are come to be private property; such rivers are called 'fluvii regales,' 'haut streames le roy,' 'royal rivers'; not as indicating the property of the king in the river, but because of their being dedicated to the public use, and all things of public safety and convenience being under his care and protection. Thus a common highway on land is called the king's highway, and navigable rivers are in like manner the king's highway by water. Many of the incidents belonging to a highway on land attach to such rivers. Accordingly any nuisances or obstructions upon them may be indicted even though the nuisances be in the private soil of any person; or the nuisances and obstructions may be abated by individuals without process of law. It must not however be inferred that all the incidents of a land highway attach to such rivers. Thus, if the highway of the river is obstructed, a passenger will not be justified, as he would be in the case of a land highway, in passing over the adjacent land. Though a river is a public navigable river there is not therefore any right at common law for parties to use the banks of it as a towing-path. (Ball *v.* Herbert, 3 *T. R.*, 253.)

If a river which is private in use as well as in property be made navigable by the owner, it does not therefore become a public river unless from some act it may be presumed that he has dedicated it to the public. The taking of toll is such an act. Callis says that the soil of the sea and of royal rivers belongs to the king. But the expression, if intended to apply to all parts of the rivers where the public have a right of passage, appears too comprehensive.

But there is no doubt that in some such rivers the property may be in the crown; as it was in the river Thames, the property in which, both as to the water and the soil, was conveyed by charter to the lord mayor and citizens of London. And in all rivers as far as the tide flows, the property of the soil is in the king, if no other claims it by prescription. In navigable rivers where the tide flows, the liberty of fishery is common and public to all persons. (Hale, *De Jure Maris et Brachiorum ejusdem;* Callis, *On Sewers.*)

The property in the mere running water is in no one; but the proprietor of adjoining land is entitled to the reasonable use of it as it runs by his land. 'And consequently no proprietor can have the right to use the water to the prejudice of any other proprietor. Without the consent of the other proprietors who may be affected by his operations, no proprietor can either diminish the quantity of water, which would otherwise descend to the proprietors below, or throw the water back upon the proprietors above. Every proprietor who claims a right either to throw the water back above, or to diminish the quantity of water which is to descend below, must, in order to maintain his claim, either prove an actual grant or license from the proprietors affected by his operations, or must prove an uninterrupted enjoyment of twenty years.'

(*Judgment of Sir J. Leach in* Wright *v.* Howard; Sim. Stuart, 109; Gale, *On Easements.*)

RIVER HORSE. Since the article HIPPOPOTAMUS was written, Dr. Andrew Smith has published his interesting account of the animal, in the *Illustrations of the Zoology of South Africa,* together with the most accurate figure hitherto engraved: of this we have endeavoured to give some idea below; but the reader should refer to the work itself, where, with all the advantages of size and colour, the portraits of the female hippopotamus and her young one have all the air of life.

As Dr. Smith has evidently paid very great attention to the characters and habits of this curious quadruped, we proceed to notice the result of his observations.

He describes the *Hippopotamus Capensis* of Desmoulins as having the anterior and lateral parts of the head, and the upper parts of the neck and body brownish red, the former rather lightest. The brownish red of the back passes insensibly into a light brownish purple red, which is the colour of the sides and limbs; the belly, the sides of the lips, and the eye-lids, light wood-brown, with a faint flesh-coloured blush; the hinder parts of the body and the belly freely freckled with small spots of the same hue as the ground colours, only of darker tints; hairs of tail and ears black: pencils of hairs on lips, &c., yellowish brown; eyes a clear orange-coloured brown; hoofs dark horn-colour.

The male and female, as far as colours are concerned, are, he observes, nearly alike, but in regard to size they differ materially, the male being always considerably larger than the female.

Dr. Smith, who gives a most elaborate description of the form of the animal, to which we refer the reader, remarks that previously to the establishment of the Dutch colony at the Cape of Good Hope, *Hippopotami* existed in abundance in all the larger rivers of South Africa; but no sooner did the colonists direct their attention to hunting them, than their numbers began to diminish, partly from destruction by fire-arms, and partly by migration from the scene of danger. 'At present,' continues Dr. Smith, 'scarcely one exists in any of the rivers of the Cape Colony, and even but very few in streams within a moderate distance of it. On the expedition arriving in latitudes too remote to be readily reached by hunters furnished with fire-arms, every large river was found to abound in specimens, and in those the animals appeared, as they probably did some two hundred years ago, much nearer to the southern extremity of the continent, familiar, comparatively fearless of man, and generally prepared to survey with curiosity any intrusion upon their haunts. To convey some idea of the numbers in which they were found in several of the rivers towards the tropic of Capricorn, it may suffice to state that in the course of an hour and a half a few members of the expedition party killed seven within gun-shot of their encampment. Several other individuals were in the same pool, and might also have been killed, had it been desirable. One of the survivors was observed to make his escape to an adjoining pool, and in accomplishing that he walked with considerable rapidity along the bottom of the river, and with his back covered with about a foot of water.'

The hippopotami, according to Dr. Smith, feed chiefly on grass, resorting to situations near the banks of rivers which supply that food. 'In districts fully inhabited by man,' says Dr. Smith, 'they generally pass the day in the water, and seek their nourishment during the night; but in localities differently circumstanced, they often pass a portion of the day as well as the night upon dry land. In countries in which the night-time constitutes the only safe period for their leaving the water, they are generally to be seen effecting their escape from it immediately before dark, or are to be heard doing so soon after the day has closed, and according to the state of the surrounding country; they then either directly commence feeding, or begin a journey towards localities where food may exist. When, previous to nightfall, they may have been in pools or rivers, they are generally at once enabled to commence feeding on reaching the dry land; but when they may have passed the day in the sea, they require commonly to proceed some distance after leaving it, before they find the grass which appears congenial to their palate. It is not every description of grass that hippopotami seem to relish: they often pass over, in search of food, luxuriant green swards, which would strongly attract many other animals which feed upon grass. Besides having a peculiar relish for the grasses of certain situations, they appear to have a predilection for districts supporting brushwood; and owing to the latter peculiarity, they are often to be found wandering in localities on which but little grass exists, when they might have it in the neighbourhood in great abundance, but without the accompaniment of wood. The whole of the night is probably not more than is necessary to admit of the hippopotamus acquiring sufficient food for its wants; but if that be otherwise, it certainly prefers to pass what portion of the night may be necessary for procuring nourishment upon the dry land, rather than in the water, being generally only seen to retire to the latter upon light returning.'

Dr. Smith thinks it difficult to decide whether these animals prefer the pools of rivers or the waters of the ocean for their abode during the day. When an opportunity for choice existed, he found that some individuals selected the one, and some the other. During a journey which he made some years ago to Port Natal and the country beyond it, he had many opportunities of observing the footsteps made by them while entering and leaving the sea; and on one occasion his party opposed unsuccessfully a female with her young one on their way to the sea.

The excrement, like that of the elephant and rhinoceros, is voided, according to the same accurate observer, in immense cylindrical masses; and those which came from the hippopotamus seemed principally to consist of comminuted grass, apparently but little altered by the process which it must have undergone, but in a drier condition than that in which it could have entered the stomach.

The disposition of this huge creature is described by Dr. Smith to be peaceable and inoffensive: not that when the animal is wounded, or happens in its excursions on dry land to be accompanied by its young, it does not manifest much ferocity, instantly giving chase, if in any way interrupted in its course. The mother which his party endeavoured to intercept immediately became the assailant on discovering the object of the party, and she rushed open-mouthed on the man nearest to her. 'The display of her enormous mouth, armed with formidable teeth, caused the most advanced of the hunters to retreat, and those in the rear to pause. The flight of the hunters seemed to encourage the animal in pursuit, and though the direction they took led her, in pursuing them, to retire from the sea which she had intended to enter, she persevered in giving chase, until one of the party, who from his situation had not had occasion to fly, fired a bullet into her mouth. Immediately after the wound was inflicted she for an instant stood still, and then retreated with precipitation to the sea, in which she was afterwards shot, having, contrary to the usual custom of her kind, manifested a disinclination to retire into deep water, a disinclination no doubt arising from sensations experienced from the wound she had received.'

Dr. Smith is of opinion that the sagacity of the hippopotamus, though doubtless inferior to that of the elephant, is nevertheless very considerable, and that its memory may be considered tenacious, certainly superior to that of the rhinoceros, and possibly equal to that of the elephant. After noticing its adroitness in guarding against assailants, and in avoiding pits dug to entrap it, the Doctor remarks that when once a hippopotamus has been assailed in its watery dwelling, and has been injured from incautiously exposing itself, it will rarely be guilty of the same indiscretion a second time; and though its haunts may not again be approached by hunters till after a long period has elapsed, it will survey such approaches, and perform the movements necessary for its respiration with a degree of caution, which clearly shows that it has not forgotten the misfortune to which an opposite course has exposed it.

Female Hippopotamus and Young. (Smith.)

RIVERS. (Geology.) [VALLEY.]

RIVERS are the flowing waters, which bring to the sea, and sometimes to a lake, the waters which are collected within a certain portion of the earth's surface. The country which is thus drained by a river is called its *basin*, as the river runs in the lowest part of it, and the country rises on all sides with greater or less steepness, in the fashion of the sides of a basin. The margin of such a basin generally lies contiguous to the basin of another river, and thus constitutes the boundary-line of the two basins. From these margins the waters descend on both sides towards their respective basins, which are separated by them, and hence the whole line of these margins is called a *watershed*.

The basins of rivers vary greatly in size. A *brook* is the name commonly given to rivers of the smallest description. When such a river rises near the sea or near a large river, into one of which it flows after a short course, it consequently drains a very small surface. If the waters should be increased by those of another brook, the name of brook is changed for that of *rivulet*. The basin of a rivulet is therefore more complicated than that of a brook. One or more brooks descend from the margin of the basin, and by uniting their waters with those of the rivulet, increase its volume. When several rivulets unite and so produce a considerable volume of running water, this watercourse takes the name of *river*. But all such rivers do not reach the sea or even a lake; most of them join other rivers, and thus a large river is produced. This last-mentioned large river is called the *principal river*, and those which increase its waters are called, with respect to it, *affluents* or *tributaries*, and sometimes *feeders* or *branches*.

The first waters of a river are generally derived from a spring, which breaks out at the foot of a declivity, or on the side of some hill or mountain; and sometimes from a swamp or a lake. This is called the *source* of a river. From this source the river descends through the lowest part of its basin until it terminates its course in the sea, a lake, or another river, and this termination is called the *mouth* of the river. The cavity in which the running water flows is called the *bed* of the river, and the solid land which bounds this bed is called its *banks*.

It was formerly thought that the elevation at which a river originates must be in proportion to the length of its course, and accordingly geographers assumed that there are elevated mountain-ranges in those regions where large rivers take their rise; but modern researches have shown that this is not always the case. Thus the Volga, which is the largest river of Europe, and runs above two thousand miles, rises in a district the most elevated part of which does not exceed 1100 feet above the sea; and the Mississippi, which is still larger, originates in a tract which can hardly be called hilly, and at an elevation probably not much exceeding 1500 feet above the sea.

But still most large rivers have their origin in very elevated mountains or on high table-lands, in descending from which a great difference with respect to the rapidity of their course and the nature of the country through which they flow, is observed. Accordingly geographers divide the whole of the course of such rivers into three divisions, the *upper*, *middle*, and *lower* course.

The *upper* course of such a river lies within a mountain region, and its source is consequently at a great elevation above the sea. The waters run with greater or less velocity, according to the greater or less extent of the mountain-region, and the greater or less rapidity with which the whole region declines towards the country to which the course of the river is directed. When the elevation of the mountain-region decreases with great rapidity, the current of the river is extremely rapid, and presents a quick succession of cataracts and rapids. The force of the current is so great that pieces of rock of considerable size, which are frequently detached from the overhanging masses, cannot resist it, and are carried down by the current, until they reach a point where the rapidity of the descent begins to diminish. The mountains which constitute the banks of the river often rise several thousand feet above it, and their bases are united by slopes forming an angle, over which the water runs on bare rocks, without the least covering of earth. Thus the river does not flow in a valley, but in a cleft or ravine, which cuts deep into the mountain masses. Sometimes there is space enough for a path between the river and the mountains, but in many places this space is only obtained by artificial means, as by cutting away a projecting portion of the rock, or by making a tunnel through it. Where either of these means cannot be applied, the path is continued over the bed of the river by a wooden bridge of greater or less extent, until a place is reached which offers sufficient space for a path on the sides of the rocks. The course of the river is generally in a straight line, but sometimes it makes short and abrupt bends which form acute angles. In the last-mentioned case it is, almost without exception, observed, that the mountains which enclose the river have on one side a projection, and on the other a receding, which correspond so exactly that if it were possible to unite both mountains, the projecting would exactly fit into the receding part. This peculiarity in the formation of the ravines of mountain streams was observed by the Spaniards in the Andes of South America, who called them *quebradas*, or broken; by this term tacitly assuming that the phenomenon had been caused by a violent disruption of the mountains. This description of mountain-streams and their ravines applies particularly to those of the western Alps along their southern declivity, to those rivers which constitute the upper branches of the rivers Doria and Sesia, to the valleys of Anzasca and Vedro on the southern side of the great road of the Simplon, and to the still larger valley of Aosta, through which the road leads from Switzerland to Italy over the mountain-pass of the St. Bernard. The military road of the Romans was made through the Val d'Aosta; but in these parts it was only practicable for beasts of burden. Such deep ravines not only occur between the gigantic elevations of a high range, but likewise in the elevated table-lands. Humboldt observes that the plain of Quito, which is nearly 10,000 feet above the sea, is intersected by ravines, which in some places sink so deep that their bottoms are hardly more than 2000 feet above the sea-level; and he adds that some of them are so narrow as not to contain the smallest cultivable space. Similar ravines intersect the table-lands of Guatemala and Anahuac, where they are called *cañadas*

When the mountain-region through which the upper course of a river lies descends with less rapidity, and consequently occupies a much greater extent of country, the mountain-streams, as well as their banks, present very different features. Both the streams and the banks show that the descent of the whole mass is not by a regular slope, but is formed by an alternation of plains and declivities; in ascending such a mountain stream, it is found that in certain places the rocky masses approach so near to the banks, as to leave hardly room enough for the river, and in these narrows the current is extremely swift, and generally a continual rapid, interrupted by falls of moderate height. These narrows however rarely extend more than a few miles. Above them the mountains recede to some distance from both sides of the river; and thus a basin is formed, in the middle of which the river flows with a comparatively slow current, not over bare rocks, but over a gravelly bed, and between low banks of earth. The bottom of the basin is level, or descends with a gentle slope, and may be cultivated or used as pasture-ground. In some of the rivers which descend from the central and eastern Alps, this alternation of narrow passes and basins occurs several times. Thus the Reuss, along which the great road runs which leads over the mountain-pass of St. Gothard, rushes with incredible velocity through the ravine of the Hospendal, and falls 1800 feet before it reaches the basin of the valley of Ursern, which is nearly eight miles long and more than half a mile wide, and in which it runs with a gentle course. At the northern extremity of the valley of Ursern the river enters the second narrow at the Urnerloch. This narrow, which extends about three miles to Geshinen, is extremely contracted, and within these limits the river descends 1074 feet, forming a succession of small cataracts. Below this is the basin of the Krachenthal, which is not so wide as that of Ursern, and about six miles long. The course of the river within this basin is rapid, but there are no cataracts. From this valley the river escapes by the third narrow, which is about four miles long, and also very contracted; it terminates at the village of Am-Stäg, where the Reuss enters the valley of Uri, in which it flows until it mingles its waters with those of the lake of Uri (Urner-see), as the southern part of the Vierwaldstädter-see is named. The same conformation is observed in the southern declivity of the Alps, where the river Ticino descends from the mountain-pass of St. Gothard. This river runs in a ravine from the Hospendal to Airolo, in which it descends about 2880 feet. It then enters the upper valley of Leventina, which is about seven miles long and half a mile wide, and in which the river is rapid, but has no cataracts. It issues from this valley by a narrow about two miles long, between Il Dazio and Faido, where a series of beautiful waterfalls occur, and the ravine is so narrow that an artificial road has been cut on the adjacent mountain called the Platifer. At Faido the Ticino enters the middle valley of Leventina, in which it flows with great rapidity to Giornico, a distance of about fifteen miles, but without forming any falls. The valley is less than half a mile wide, and often interrupted by rocks. Above Giornico the river enters a short narrow, at the outlet from which it forms cataracts, and then reaches the wide valley called the Lower Valley of Leventina, in which it flows with a comparatively gentle course to Lago Maggiore. The greater number of the rivers which originate in the Alps and Pyrenees are of this latter discription. The basins which occur in these river-valleys may at some remote period have been filled with water, and this may have been drained off by the rivers forming an outlet for the waters by the narrows which now connect their basins with one another.

In some places the elevated mountain-regions border immediately on low plains. In such cases the rivers cannot be said to have a middle course; for as soon as they reach the plain their character is changed, and the rapid torrent is converted into a gentle stream. Thus the Marañon, after issuing from the Pongo de Manseriche, and entering the great plain, flows slowly through the alluvial level; and the Ganges, after leaving the Himalaya Mountains at Hurdwar, flows with great bends through the immense plains of Hindustan. All the rivers which descend from the southern declivity of the Alps to the plain which the river Po traverses are of the same description. In most cases however the mountain-regions are not in immediate contact with the plains, but are separated from them by hilly tracts, and that portion of the course of a river which lies through such a hilly region is called the *middle* course. The rocky masses rarely approach the bed of the river which has a middle course, but retire to some distance from them, so as to form between the higher grounds a wide valley, which the inundations of the river have covered with a thick layer of alluvial soil. It is remarkable that the highest ground of these valleys occurs, without exception, on the very banks of the rivers, and that the land slopes from them towards the base of the higher grounds. Accordingly the inundations generally cover the lower tracts, which are at some distance from the river, to the depth of several feet, while the banks are still above the surface of the water. The slopes of the higher grounds, which may be considered as the outer banks of the river, because they fix a limit to its inundations, are generally gradual, and covered with vegetation. The current of the river itself is gentle. This change, when compared with that of the mountain-stream, is partly due to the more gentle descent of the hilly region, and partly to the form of its course. The bed of the river rarely lies in a straight line, but continually forms bends, which are not acute angles, as in the case of the mountain streams, but have only a small curvature, so that the river runs through the valley in a serpentine course. This circumstance renders the course of the river much longer than it would be, if it flowed in a straight line, and consequently diminishes the fall and the rapidity of the current.

It is observed that rivers form numerous small islands and sand banks a short distance below the place where they issue from the mountain-region. Thus the Rhine, between Basel and Kehl, opposite Strasburg, and the Amazonas below the Pongo de Manseriche, as far east as the mouth of the Yapura, and the Mississippi, between the mouth of the St. Peter river and that of the Missouri, form islands and sand-banks. This is easily to be accounted for, by observing that the river, on issuing from the mountains, retains a large quantity of earthy matter in suspension, which subsides when the current decreases in rapidity. This sediment forms islets and sand-banks. Though it rarely happens, as already observed, that the rocky masses approach close to the banks in the middle course of a river, yet this generally occurs several times, and at such places the river usually forms rapids and whirlpools. A ledge of rocks traverses the bed of the river in some places. Such ledges occur in the Danube at Passau, near Neuburg above Vienna, near Presburg in Hungary, above Pesth, and at Orshova, or Orsova, on the boundary line between Austria and Turkey. On the Rhine they occur only between Mainz and Bonn, where the river is traversed by three ledges, at Bingen, at St. Goar, and near Andernach respectively. Such ledges are found in nearly all the large rivers of Europe. The elevations by which they are produced are sometimes connected with ranges of hills.

Ledges of this description occur in many of the Atlantic rivers of the United States, as the Potomac, the James River, and others; and they mark with precision the passage of the rivers from the undulating or hilly region to the low plains along the coast. There are of course rapids where these ledges occur.

The *lower* course of rivers usually lies through a plain. In general there are no hills which constitute the outer margin of its course, and consequently there is no bottom or valley through which it runs. The banks are very little raised above the surface of the waters, and the level ground extends to a greater distance. The current is slow, the fall being very small. Thus it was observed by La Condamine, that the Amazonas from the narrow at Obydos to its mouth, a distance of 700 miles, does not fall quite twelve feet, or little more than 0·2 of an inch per mile. It can hardly be conceived that a river with so small a fall could propel its waters, and as the current of the Amazonas is considerable it can only be accounted for by supposing that the enormous volume of water which the river brings down, drives on by its pressure that which is before it until it reaches the sea. The surface of the Elbe at Hamburg, about 70 miles from the North Sea, is not more than 6 feet above the sea, and the fall per mile very little exceeds an inch. The surface of the plain through which a river runs generally consists of an alluvium, which the river has deposited during the inundations. The matter of which this alluvium consists is soft and loosely bound together, and consequently the current, slow as it is, has power enough to remove a portion of the banks from one side, and to deposit the detached matter on the other. Thus great changes are produced in the course of rivers in the lapse of time. Major Rennell surveyed a large portion of the lower course of the Ganges about fifty years ago, and his maps were very exact at the time. He also observed the changes which the river had produced in its bed. A few years ago the course of the Ganges was again surveyed, for the purpose of establishing a steam navigation, and it was found that the course of the river hardly in any place agreed with the maps of Rennell. The most remarkable circumstance however is, that a river frequently divides into a number of arms, each of which runs to the sea, though some branches re-unite and again detach themselves from one another. Thus the Danube reaches the sea by seven arms, as the Nile formerly did, according to the antient accounts, though there are now only five arms in the Nile. Our best maps represent the number of the mouths of the Ganges as amounting to ten at least. This division of a river into several arms is easily understood when the soft nature of the alluvium is considered: and if we suppose that the river, in its operation of changing its bed, finds in its way a piece of rock or other matter harder than the alluvial soil, by setting against such an obstacle the current is divided, and flows on both sides of it: the following inundation removes still more of the alluvium, and thus, in course of time, a new arm is formed.

The country which is enclosed by the arms of a river is called its *delta*, from the form of the Greek letter Δ, which the delta of the Nile, that which was best known to the antients, greatly resembles: but the term is generally appropriate, as most river deltas have that form. It is a common conjecture that the space which is now occupied by the delta of a river was once a part of the sea, which was filled up by the débris and earthy matter brought down by the river from the mountainous and hilly country through which its upper and middle course lie. This supposition is strongly supported by the nature of the soil, which evidently consists of matter brought down by rivers, and not of such as the sea leaves behind when, from any cause, it retires. It may be added, that this operation of rivers goes on during the inundations, for after the waters have subsided the surface of a delta is found to be covered with a very thin layer of mud, which soon becomes dry earth. The deltas of rivers which are annually swollen by rains, which is the case between the tropics, are generally much more extensive than those which are formed by rivers whose inundations are only produced by the melting of snow.

There is a river of first-rate magnitude which has no delta, though it seems to possess all those qualities which are supposed to be requisite to the formation of such an alluvial tract: the St Lawrence in North America reaches the sea by a kind of bay, which extends upward of 300 miles, and gradually increases in width from three to above one hundred miles. One would suppose that the form of this bay would render it subject to be easily filled up by the earthy matter brought down by a river whose course exceeds 1800 miles; and yet we do not find that an alluvium of any extent has been formed along the banks of this wide æstuary, except on the right bank below Quebec. This single instance might throw some doubt on the opinion that deltas are formed by rivers in the way above mentioned, if the peculiar nature of the St. Lawrence did not suggest an explanation of this deviation from the common course of things, which rather confirms than refutes the established principle. The St. Lawrence is the only large river which traverses a great number of lakes. Even after having left the five great Canadian lakes, it passes through those of St. Francis, St. Louis, and St. Peter's. In each of these lakes the current ceases, and it is only perceptible where the river again issues from the lake. All the earthy matter therefore which the river collects and keeps suspended in its course from one lake to the other is deposited in these lakes. Thus this large river brings no débris and earthy matter, or very little, to its wide æstuary, which cannot therefore be changed into a delta by the accumulation of such matter.

Most large rivers, as already observed, admit of this division of their course into three parts, an upper, middle, and lower course; but the exceptions are far from being rare. It sometimes happens that the characteristic features by which the middle course is distinguished, occur in the upper course. This takes place when a river originates on an elevated table-land, and traverses a considerable part of it. Thus the Indus, the Sutlej, an affluent of the Indus, and the Sampoo, rise on the elevated table-land of Tibet, and drain a portion of it: in this part of their course they resemble the middle course of the Rhine or Danube. But where they leave the plain and enter the mountain-region of the Himalaya, they resemble the mountain-streams of the Alps, except as to the volume of water. When the Indus and the Sutlej have descended into the plains of the Panjab, they assume the character of the lower Rhine and lower Danube. The Sampoo, after leaving the mountain-region, traverses a hilly tract of great extent, the valley of Asam, before it enters the alluvial plain of Bengal. There are other rivers, in which only the characteristic features of the middle and lower course can be recognised: the number of such is considerable, and some of them are of the first magnitude. Thus the Volga and the Mississippi, neither of which rises in a mountain-region, but in a hilly tract, in the greater part of their course present the characteristics of the middle course of the Rhine and Danube, but towards their mouths they traverse a large plain. The number of rivers whose whole course lies through a hilly or undulating country is still greater, as is the case with nearly all the rivers of England and Southern Scotland, except the Humber, whose course is partly through a low plain. There are also rivers which in their whole course traverse a mountain-region, but they are all small; such are some of the rivers in North Scotland and in Sweden, and nearly all the rivers of Norway, and those on the west coast of South America.

The number of rivers which do not reach the ocean is not great, if we except those which fall into the Caspian Sea and into the lake of Aral. The other rivers without an outlet always terminate their course in a lake. It was formerly supposed that the water of some of them was absorbed by a dry soil, and that they were lost in the sand; and this opinion still prevails as to some rivers which descend from Mount Atlas southward to the Sahara. But one of these rivers have been visited by Europeans, the t remains doubtful. Among other rivers which have [illegible] nunication with the sea, some few traverse elevated table-lands, consisting of plains surrounded by continuous ntain-ranges, through which the waters cannot find an outlet, and consequently collect in the lower part of the plains, and form lakes large enough to part with all their surplus water by evaporation. Such rivers occur in the valley of Tenochtitlan in Mexico. The most remarkable is the Desaguadero, in the valley of Titicaca in Bolivia, which runs about 300 miles, and is lost in a lake or in swamps. The Hyarkan or Yerkan, in Chinese Turkistan, is still larger, but its character is imperfectly known. Another kind of such lakes occurs in the plains of Mexico and of South America, and almost exclusively in those parts which have no rain or very little. On the table-land of Mexico the greater number of rivers between 24° and 30° N. lat. terminate in lakes; and in the states which compose the Argentine Republic, rivers of this kind are numerous between 28° and 34° S. lat., west of 64° W. long. As very little rain falls in some of these countries, and in others none at all, the rivers are supplied with water by the rains which fall at certain seasons on the mountains in which they originate, and by the springs which exist there. But as the supply of water is very moderate, it does not give force sufficient to the currents to carry them through those extensive tracts which separate them from the sea. It is remarkable that some of these rivers and all the lakes in which they terminate, are salt in South America; and it is probable that this is also the case with most of those on the Mexican isthmus.

Most rivers overflow the low countries which are adjacent to their banks, either at regular seasons of the year or occasionally. This takes place when the supply of water is greater than the bed of the river can contain. In this respect rivers may be divided into three classes: the first comprehends the rivers whose inundations are produced by the melting of snow and ice; the second comprehends those which are annually swollen by regular rains; and the third those which only occasionally cause inundations.

All large rivers that drain countries of which the mean winter temperature is below 30°, are annually subject to great risings when the snow and ice melt. In such countries snow falls for several months, and as only a small part of it is dissolved, it accumulates to a great amount. As soon as the frost ceases, the snow begins to melt, and runs off by the smaller rivers, which suddenly swell and carry an unusual supply of water to the principal river, whose volume being thus increased to three or four times its ordinary magnitude, overflows the adjacent low country. These inundations, though they generally improve the soil, are very injurious to agriculture, by destroying the growing corn, and covering extensive tracts with sand, gravel, and other coarse earthy matter. Embankments are usually made to prevent these inundations, but after a very long winter, when the river is more than usually swollen, these embankments are often destroyed, and the injurious effects of the inundations are increased by the mass of earthy materials of which the embankments consist, and which are dispersed over the adjacent lands. In some rivers these inundations last only from two to four weeks; in others two or three months; and in some even five or six months. Where the inundations are long, they are less violent, and cause less damage than where they are short; in the latter case the whole mass of water suddenly deluges the country, while in the former the water rises slowly. This difference in the inundations of rivers is mainly to be attributed to the direction in which they flow. Let us take a river like the Mississippi, which flows from north to south through 17° or 18° of latitude. In winter the basin is covered with snow, and if the whole were melted in a few days, it would produce such a volume of water as would probably cover nearly half the basin. But the melting of the snow is gradual. Whilst the temperature in the northern districts is below the freezing-point, the spring has already made considerable progress in the southern districts, the snow which has there fallen has been dissolved, and the water thus produced has had the requisite time to run off and reach the sea. Thus with the progress of the sun towards the northern tropic, the line of the melting snow proceeds northward, and thus the supply of water runs off gradually, until the snow of the most northern region is dissolved. More than two months elapse between the melting of the snow in the northern region and the commencement of the melting in the lower part of the river. The inundations of the Mississippi therefore are not extensive, if the great length of that river and of its affluents are considered, but they last from three to four months. A considerable part of the delta of that river is indeed under water for six months, but this must be ascribed to the tract of elevated ground which extends not far from the sea between the Atchafalaya and the La Fourche, and prevents the enormous mass of water which collects in the lowlands near the first-mentioned branch from running off sooner. When a river situated in the northern hemisphere flows from south to north, the melting of the snow of course commences near the upper branches of the river, and proceeds northward. In this case the volume of water which collects at a certain period in the lower course, where the lowlands are generally most extensive, is much greater, and the inundations are much more extensive and attended with more mischief. But still they cannot be compared with the inundations of those rivers which run from east to west or from west to east. In countries which are drained by such rivers, the whole mass of snow is dissolved in a few days, especially when a thaw is accompanied by rain, and all the waters thus produced pass through the principal channel in the course of a week or two. In such rivers the volume of water during the inundations is three or four times larger than it is in the middle of the summer or the beginning of autumn, and the inundations spread to a great distance, and frequently cause great loss of property, and sometimes also of life, especially when the winter has been unusually long and the falls of snow very heavy. [NIEMEN.] But the river St. Lawrence forms an exception here also. As its general course is from west to east, one would suppose that a large extent of country within its basin would be annually subject to inundation, but this does not appear to be the case in any part of its course. If any portion of it is swollen by the melting of the snow within the basin, the river soon enters one of the lakes through which its course lies, and thus the addition of a comparatively small volume is not sufficient to raise the surface of the lake to any large amount. Thus the same cause which prevents its filling up the wide estuary, prevents the river from overflowing the adjacent country.

Rivers whose inundations are produced by regular rains have the greater part of their course either within the tropics or at least between 30° N. lat. and 30° S. lat. It is a known fact, that in those regions heavy rain falls daily from three to six months in the year. These heavy rains commence when the sun in its progress from one tropic to the other approaches the zenith of a country, and they continue till it has passed a certain distance from it. In the beginning of the wet season, as this part of the year is called in those countries, the rains are sometimes so heavy that in the course of a day the level country is covered with water a foot deep. The rivers of course soon begin to increase in their volume of water, and after some time they rise to the level of the banks, and begin to run over. These inundations generally last from two to four months. They are more regular than those which are produced by the melting of the snow, and in general do not exceed a certain height. The rural economy of those countries in which they take place, is founded on the knowledge of this periodical event, and on the certainty that the inundations will fertilise the fields by depositing on them a fine mud, which enriches the soil more than the best manure. Whenever the inundations do not rise to the usual height, which is sometimes the case, a great part of the country which is not covered with water yields little or nothing, and the consequence is dearth and famine. When, on the other hand, the inundations rise higher than usual, they are also injurious to rural economy, by reaching those tracts which are set apart for the cultivation of plants, which cannot bear so much moisture as the districts that are regularly flooded. Thus, in 1831, the river Menam in Siam rose to an extraordinary height: the inundations reached the large orchards which for many miles in extent cover the more elevated tracts along the banks, and afford subsistence to a numerous population. Several kinds of fruit-trees were almost destroyed, and for some years the mangustans and durians were scarce.

All the rivers between the tropics which are swollen by periodical rains, lie only in one hemisphere, the northern or the southern. In the countries through which they flow the waters are low and the ground dry during part of the year, so as to admit of easy cultivation, and at another season the fields are fertilised by the inundations. The Amazonas alone is an exception. Though the course of this river is in the southern hemisphere, its affluents extend far to the north and south, into both hemispheres, and probably three-fourths of the tropical rains which descend upon South America find their way to that large river. To this circumstance are owing its immense volume of water and its great depth. The Amazonas, properly speaking, is never at its lowest level, in the sense in which that term is applied to other rivers. When the northern rivers cease to bring down the supply which is owing to the periodical rains, the southern begin to bring their contributions. This fact seems sufficiently to explain the immense tracts of alluvial soil which extend along the river to a great distance, but the same circumstance also keeps the soil in a state of continual moisture, and makes it a perpetual swamp. Accordingly we find that the banks of that river, which admits of a more extensive navigation than any other river in the world, remain nearly destitute of agricultural settlements, and are still in possession of savage tribes.

The rivers which drain the countries between 30° N. latitude and those in which the mean temperature of the winter season does not rise above 30°, are subject to occasional inundations. But these overflowings occur only in those rivers whose upper course lies within mountain-ranges which are covered with snow for a considerable part of the year. In such cases, while the snow covers the more elevated portion of the mountain-ranges, a sudden change in the weather, which produces a warm wind, brings great volumes of vapours, which, falling in abundant rain, soon dissolve the snow, and the mountain-streams pour down their waters with increased volume and velocity. As soon as the waters reach a level tract, it is inundated. As these inundations often take place unexpectedly, they cause great damage. Thus we find that some valleys in the Ozark Mountains, in the United States of America, are almost uninhabitable, owing to the sudden inundations to which the rivers of that mountain-region are subject. Many rivers however never inundate the adjacent country, unless a heavy gale of wind should blow directly up the river, and drive the sea into it with great force. Such inundations are very sudden, and sometimes also extensive, but they are of short duration.

In adverting to the advantages which a country derives from its rivers, we must first observe that the water is extensively used for the purposes of domestic economy. It is much purer than that of wells; for, with the exception of a few which are salt or brackish, river water contains only earthy particles in suspension, which may easily be separated by filtration, and which are deposited as a sediment when the water is left to stand for a short time. The water of wells generally contains a small quantity of some mineral in chemical combination. The water of rivers is nearly equal to rain water for all domestic purposes. Rivers accordingly supply water for the consumption of large cities, as in the case of the New River [MIDDLETON, HUGH], which supplies a large part of London, and the Schuylkill, which supplies Philadelphia. Many rivers also supply abundance of food. The upper courses of rivers are generally inhabited by a small number of species of fish, and the whole amount is not great. But towards their mouths the number both of species and individuals increases. The importance of a river fishery may be estimated when we consider the quantity of salmon which is taken in the rivers of Britain, or of the beluga and sturgeon which are caught in the neighbourhood of Astrakhan. Many rivers, which are not adapted to the purposes of navigation, are converted into powerful instruments for assisting the industry of a country by the moving-power which they supply for mills and other heavy machinery. The advantage of such a natural moving-power primarily determines the seat of manufactures, as was the case in South Lancashire, where this advantage is combined with abundance of coal. The Atlantic States of North America are generally provided with abundance of streams, a circumstance which favours the establishment of manufactures.

The greatest advantages however which a country derives from its rivers are the facilities which they supply for conveying the produce of agriculture and of manufacturing industry to distant parts at a moderate expense. In this respect the rivers may be compared to the arteries and veins of the human body, which diffuse life and strength through all parts. Navigable rivers vivify, maintain, and excite the efforts of human industry. In many countries, where roads are neglected, it is estimated that the transport of goods by land is four times as expensive as that by means of navigable rivers, and thus many heavy and bulky commodities could not be brought to market but for the cheap conveyance of rivers. In considering the capacity of a river for navigation, two circumstances mainly require notice—how far seafaring vessels may ascend, and how far the river is navigable for river boats.

Seafaring vessels can ascend many rivers as far as the tides extend. Indeed some rivers, as the Amazonas, may be navigated by large vessels to a much greater distance than the tide ascends, but in others the waters become shallow long before the limit of tide-water is reached. Still high tides facilitate the navigation of rivers by large vessels, not only by producing a current contrary to that of the river, but also by temporarily increasing the depth of water so that vessels can pass over shallows and sandbanks, which at low tides are nearly or quite dry. This is frequently the case in rivers where the tides rise more than 12 feet. The tides in rivers are not of equal duration, as is the case in most parts of the sea; but the ebb tides frequently last twice as long as the flowing tides. At Rotterdam the tides flow for about 4 hours and 5 minutes, but the ebb lasts 7 hours and 55 minutes. The Meerwede at Dordrecht flows against the current of the river for 3 hours and 51 minutes, and with it 8 hours and 9 minutes. This difference is easily explained, when the force of the river current is taken into account. The same circumstance explains the difference in the velocity of the ebbing and flowing tide. Between the North Sea and Hamburg, the flowing tide takes five minutes to run up a mile, but the ebb tide performs the same distance in less than four minutes. But it is difficult to explain the well-established fact that the tides advance much farther into a river than might be expected. When the tide at the mouth of a river rises four feet, we might suppose that it would advance only to such a point in the river, where the surface is four feet above the sea, but it has been ascertained that it advances farther. It seems that the volume of water which is carried up by the tide is pushed onwards by the mass behind it, and carried to a greater distance than the inclination of the river bed would seem to allow. It has also been observed, that during the flowing of the tide the surface of the water in the river presents a somewhat convex form, the water along the banks being a little lower than in the middle of the river, and that during the ebb the contrary takes place. The flowing tide raises the water from below, and thus sooner affects the main body of the river, where it has more room to operate, than the water near the margin. In accordance with this explanation, it is observed that the flowing tide is perceptible in the middle, while it is still ebbing along the banks, and that vessels which are at anchor near the banks are turned round before the water on the surface of the river near the banks begins to flow upward.

In a few rivers the tide ascends to a great distance from the sea. In the Amazonas it is perceptible in the Narrow of Pauxis near Obydos, a distance of nearly 500 miles from the mouth of the river, measured along its course. If we suppose that the tide in this river advances at the rate at which it runs in the Elbe between the North Sea and Hamburg, namely, nearly a mile in five minutes, the tide can only reach the Narrow of Pauxis in 42 hours, or in a space of time during which the direction of the tides has changed seven times at its mouth. It is therefore evident that the current of the Amazonas between the sea and the Narrow of Pauxis must, at the same time, in three or four different parts of its course, follow the impulse given to it by the tide, and run against the stream. We are of opinion however that the tide in the Amazonas advances more slowly than in the Elbe, owing to the stronger current of the Amazonas, and that the number of high tides in the Amazonas, between the two above-mentioned points, will probably be found to be five or six. The tide rushes into some rivers with great impetuosity, and produces what is called a bore. [Bore.]

Human ingenuity, even in the lowest state of civilization, has perceived the use of rivers as means of conveyance. Perhaps all rivers which have water enough to carry the smallest boats of any shape or form are navigated, except where the nature of the current opposes insuperable obstacles. These obstacles consist of *cataracts* or of *rapids*. When the river descends from a rock which rises several feet perpendicularly, it rushes down in a broken sheet of water, and is said to form a cataract. When the water descends with great velocity over an inclined plane of rock, it is said to form a rapid. A cataract may be descended when it is only a few feet high. Rapids may be ascended and descended in most cases with great labour and some danger, when they are not very long, and the bed of the river is free from projecting rocks, which however is rarely the case. The ascent of rapids is effected either by poling or by dragging the boats over the dangerous place by means of long ropes. Sometimes ropes are also used in the descent, as in the Rhine at Laufenburg in Switzerland. But generally either the whole cargo or a part of it must be taken out of the boat, and carried a certain distance by land. Such a tract, over which goods must be carried, is called a *portage* At long and dangerous rapids the boats themselves must be carried or dragged over the portages.

River boats differ greatly in shape and construction, being always adapted to the nature of each river. Most rivers contain numerous shoals, on which the water is very shallow, and accordingly flat-bottomed boats are used, like the coal-barges in London. Keel-boats can only be used where the river has a depth of a few feet, and is free from shoals and sand-banks. When a river is shallow and rapid, but of considerable width, rafts are substituted for boats. Rafts generally consist of trees fastened together with ropes or the flexible branches of trees, or, in warm countries, by creeping plants; goods are placed upon the raft. When these rafts with their cargoes have arrived at their place of destination, the raft itself is sold, either as timber or as fire-wood, according to its dimensions and quality; and the crews return by land. When a river is too full of cataracts and rapids to allow either boats or rafts to descend, it may still be used for floating down timber or fire-wood. The trunks of trees, after being deprived of their branches, are thrown singly into the current, and towards the mouth chains are laid across the river, above which the trunks collect, and whence they are carried to their destination. This is frequently done in the rivers of the southern districts of Norway.

Rivers which traverse a mountain-region in some parts of their course, are either not navigable in this part or only in some places. Thus the Amazonas and Ganges, where they respectively flow within the ranges of the Andes and Himalaya Mountains, are not navigable, but the Rhine and the Danube are navigable even within the mountains, in some parts for a considerable distance. The most extensive system of internal navigation is presented by those rivers which have a long course, and whose sources are situated at a comparatively small elevation above the sea. The Volga is navigable in the whole length of its course, and the Mississippi up to the Falls of St. Anthony, a distance of about 1800 miles, measured along the river. Both these rivers, as already observed, have the greater part of their course between hills of small elevation, and they do not traverse a mountain-region.

The rivers of England supply the means of an extensive system of inland navigation, a circumstance partly due to their small fall, their sources being only a few hundred feet higher than their mouth, and partly to the abundant supply of water from rain, mists, and springs. Accordingly, if two rivulets unite, they generally form a small navigable river; and such as are not navigable, become useful as feeders to canals. The navigation of most of the rivers of England has been much improved by artificial means.

The Thames is navigable for large sea-vessels to London Bridge, a distance of 45 miles from the Nore, though the whole course of the river, measured along its windings, hardly exceeds 200 miles. No river in the world, perhaps the Amazonas excepted, is navigable for vessels of such dimensions for one-fourth of its course. This circumstance is not due solely to the height of the tides, which is about 19 feet at London Bridge, but mainly to the fact that there are no sand-banks at its mouth which prevent the access of large vessels. The river probably brings down sufficient earthy matter to form a bar, but owing to the direction of the tide, which is kept off from the mouth of the river by the projecting coast of Kent between the two Forelands, and there being consequently nothing to oppose the current of the river at its mouth, the earthy matter is carried farther from the coast, and deposited in deep water.

The advantages hitherto enumerated are common to rivers in all parts of the globe, but there are some countries in which the value of rivers is much increased by the use which is made of the water for irrigation. This occurs in those countries in which it either does not rain at all, or in which rain occurs only at a certain period of the year, and even then only for two or three months. The first class of such countries, for instance the western coast of South America between 5° and 28° S. lat., would be uninhabitable but for the rivers which descend from the western declivity of the Andes, and in their course to the sea have furrowed the surface with deep depressions or valleys, in which agriculture is carried on with success as far as the water of the river can be dispersed over the level part of the valleys by small canals. In those warm climates where the rains occur periodically, though only in two or three months of the year, the fields would certainly produce a crop, even without irrigation; but for more than half the year the soil would produce nothing for want of water. By using the water of the rivers for irrigating their lands, the inhabitants of those countries are enabled to get two and in many cases three crops annually. Even in the southern countries of Europe, where rain is very scarce in summer, and not sufficient to maintain vegetation, whilst the heat is excessive, irrigation is practised, and two crops of Indian corn are thus annually obtained, or one crop of wheat and a green crop.

In those countries in which the temperature for three or four months is under the freezing-point, the rivers during that time are covered with ice, and in this state they afford to the inhabitants, in some degree, the advantages which other countries derive from railways. Traveling and the transport of goods on the smooth ice of the rivers are much less expensive, and are performed in a shorter time than in summer in the ordinary way. This is the case on some of the rivers of New Brunswick and Lower Canada.

It has been observed that the outer borders of river-basins are the most elevated parts which occur in some given places between their respective beds, though it is not always the case that the watershed is formed by mountain-ridges. Owing to such a disposition of the surface, the waters which are collected on or near the borders, run to one or the other of the two rivers. Up to the commencement of this century it was thought improbable, if not impossible, that two different river systems or basins could be united by a natural water communication. But it is now ascertained that a low tract of country or a deep depression of the surface may occur, by which a portion of the water of a river, after being diverted from its own channel, may join a river which otherwise is not connected with that river from which the water branches off. The instances in which this occurs are very few, and we shall therefore enumerate those whose existence is beyond all doubt. The river Arno in Tuscany, in that part where it runs between the high ridges of the Apennines and approaches the town of Arezzo, sends an arm southwards through a narrow valley, under the name of Chiana, which falls into the Chiare, an affluent of the Tiber. The Chiana had been filled up with sand, but its course has been re-established by artificial means. Another case occurs in the kingdom of Hanover, a few miles east of the town of Osnabrück, where the river Haase divides into two branches, of which one, running west to Osnabrück, preserves its name, and after a course of many miles joins the Ems; the other, running east under the name of Elz, falls after a short course into the Werre, an affluent of the Weser. In Sweden, two large rivers fall into the northern extremity of the Gulf of Bothnia, the Tornea Elf and the Calix Elf. About 100 miles from the sea, the last-mentioned river sends off an arm to the south east, which after a course of about twelve or fifteen miles falls into the Tornea Elf: this arm is called Tarenda Elf. In these cases the rivers thus united by a natural water communication flow in the same direction or nearly so. But in South America two large rivers, the Orinoco and the Amazonas, are united in this way in a part of their extensive courses, where the Orinoco runs west and the Amazonas east. The branch of the Orinoco by which this natural water communication is is effected, is called Cassiquiare. [CASSIQUIARE.]

It is a kind of established rule that the whole course of a river should bear the same name, and that this name should be continued to that branch whose sources are farthest from the mouth. But practice is frequently at variance with this rule, and it may easily be accounted for. The inhabitants of a country preserve the name of that river which does not undergo any deflection of its course. At the confluence of the Mississippi and the Missouri, the latter is the larger river, and has had a course of above 1000 miles more than the former, but it does not deflect the course of the Mississippi by its junction, and the name of the last-mentioned river is preserved. The same occurs in South America as to the Amazonas and Madeira, where we find that the last-mentioned river changes the direction of its course to meet the Amazonas, whose name is preserved. In Europe, the Rhine is joined by the Aar in Switzerland, above Laufenburg. The Aar is the larger river and brings down a greater volume of water, but the Rhine, where it is joined by it, continues its westerly course, and its name is preserved.

The extent of a few river basins is here given in round numbers, but they must only be considered as rough approximations:—

Rivers.	Square Miles
Thames . . .	5,500
Rhine . . .	89,000
Euphrates, including the Tigris	243,000
Brahmapootra . .	270,000
Danube . . .	312,500
Indus . . .	410,000
Ganges . . .	443,000
Volga . . .	653,000
Nile . . .	707,500
Yan-tse-kiang . .	742,000
Mississippi . .	1,100,000
Plata . . .	1,560,000
Amazonas . . .	1,920,000

RIVESALTES. [PYRENEES ORIENTALES.]

RIVIE'RA, a name given by the Italians to certain long narrow strips of land extending between mountains and the sea-coast. The most familiar instance is that of the coast of Genoa, which is divided into Riviera di Levante, or Eastern Riviera, which extends from the city of Genoa to the Gulf of La Spezia, and Riviera di Ponente, or Western Riviera, which extends from Genoa to Nizza. The Western Riviera is the more fertile and populous; but in the Eastern Riviera, which is generally more rugged and barren, there are some delightful spots, especially about Nervi, Rapallo, and Chiavari, sheltered by the mountains from the north winds, and where the orange, lemon, and other southern plants thrive in the open air. [SARDINIAN STATES.] There is also a tract along the western shore of the lake of Garda which is called Riviera di Salò, from the town of that name. [GARDA, LAKE OF.]

RI'VOLI, in Piedmont, a town situated about ten miles west of Turin, on the road to Mont Cenis. A wide and straight avenue, lined with fine elm-trees, leads from Rivoli to the capital, through a rich plain irrigated by canals. Rivoli has 5000 inhabitants, and a royal palace situated upon a height.

There is another small town or village called Rivoli in the province of Verona, situated at the southern entrance of a defile through which the Adige coming from the Tyrol makes its way into the plain of Lombardy. Rivoli is on the right bank of the Adige, at the foot of a lofty ridge called Monte Baldo, which extends between the river and the Lake of Garda. A hard-fought battle took place at Rivoli between the French under Bonaparte and the Austrians under General Alvinzi, on the 14th of January, 1797. The village was several times taken and re-taken by the two armies. At last General Massena, coming up with his division, carried the day, and Alvinzi was obliged to retire with great loss. Massena obtained afterwards, under the empire, the title of Duke of Rivoli.

RI'ZZIO. [MARY STUART, vol. xiv., p. 477.]

ROACH. [LEUCISCUS.]

ROAD. Under this head it is proposed to embrace road-making, with a brief sketch of the history of roads, referring for more detailed statistical information to the geographical articles in this work, and to WAY and TURNPIKE TRUSTS for an explanation of the laws respecting the formation and maintenance of the highways in this country.

The importance attached to roads by the great nations of antiquity is abundantly testified by historians, though, except in the case of the Roman roads, there are few remains existing. The Carthaginians are said to have been the inventors of paved roads, which were much used by the Romans, who were distinguished by the vast extent and solid construction of their highways, of which several thousand miles were made in Italy alone, while every country which was brought under their sway was more or less intersected by these channels of communication. Though formed mainly to facilitate military movements, the Roman roads were productive of the greatest civil benefits. Being made by a power whose resources were almost unlimited, these military roads were usually laid out in straight lines from one station to another, with little regard to natural obstacles, which were frequently passed by means of very extensive works, as excavations, bridges, and, in some instances, tunnels of considerable length. The solidity of their construction was fully equal to the boldness of their design; a fact proved by the existence of many that have borne the traffic of near two thousand years without material injury. The Roman engineers were very particular in securing a firm bottom, which was done when necessary by ramming the ground with small stones, fragments of brick, &c. On this carefully prepared foundation a pavement of large stones was firmly set in cement, the stones being occasionally squared, but more commonly of irregular shapes, though always accurately fitted to each other. For this purpose many varieties of stone were used, but the preference seems to have been given to basalt, where it could be had, it being used in many situations in which other suitable materials might have been procured with less labour and expense. Where large blocks could not be conveniently obtained, small stones of hard quality were sometimes cemented together with lime, forming a kind of concrete, of which masses extending to a depth of several feet are still in existence. The strength of their pavements is illustrated by a fact, related by a modern traveller, who states that the substratum of one still in use has been so completely washed away by a current of water without the surface being at all disturbed, that a man may creep under the road from side to side, and carriages pass over the pavement as over a bridge. The Roman roads were generally raised above the ordinary surface of the ground, and frequently had two carriage tracks separated by a raised footpath in the centre.

In some parts of the continent of Europe, especially in Italy, the Roman system of road-making has been imitated, particularly in city pavements; but in Britain the attempts to follow the Roman model appear to have been very limited, and road-making has been very imperfectly practised till within a few years. Many of the existing highways were originally mere paths or tracks from place to place, their course having been determined more by accidental circumstances than by a due attention to the properties of a good road. Thus deviations were made from the direct course in order to cross rivers at fordable points, and the road was conducted over a hill in preference to a more level course round its base, to take advantage of natural drainage. As improvements have been introduced in the systems of construction and repair, the direction and levels have been frequently left unaltered, to avoid the temporary inconvenience and expense attending a deviation from the established course. The scanty information we possess as to the state of the roads in early times indicates that it was very bad; and after the introduction of turnpikes, and even down to the commencement of the present century, the greater part of the roads were, owing to injudicious modes of construction and repair, in a state very unfit for traffic.

The inefficiency of the system of maintenance by parish and statute labour was proved before the passing of the first Turnpike Act in 1653; yet the necessity of improvement, and the obvious justice of maintaining roads by the produce of tolls, did not lead to the extensive adoption of the turnpike system for about a century after that time. In the latter half of the last century turnpike-roads multiplied rapidly, and superior principles of construction also made some progress.

During the last forty years the attention of government has been repeatedly directed to the importance of this class of public works, and the Highland and Holyhead roads, formed by Telford and others, have done much in improving and extending the science of road-making. The Highland roads alluded to were made under the commission of 1803, and originated in the military roads formed in consequence of the rebellions of 1715 and 1745, which had been found very beneficial to the districts to which they afforded the means of access. The roads made and improved under the management of the Highland-Road Commissioners extend to more than 900 miles, the whole being in a mountainous district, but so well laid out that their inclinations are always moderate. The works executed in the formation of these roads are very extensive, and comprise upwards of 1100 bridges. The Holyhead road improvements were commenced in 1815, and in these Telford and his able assistants had the opportunity of carrying into effect, under a government commission, a plan of road-making suitable to a great traffic, on principles generally considered to be nearly perfect. The principles on which these important works have been executed are very fully detailed by Sir Henry Parnell, in his valuable 'Treatise on Roads,' to which work the writer of this article is indebted for much of the following information. The name of M^c. Adam must not be passed over without notice in this place, as his exertions have done much towards attracting public attention to the improvement of roads, even where his peculiar principles have not been acted upon.

Though much remains to be accomplished, and the philosophy of road-making is yet very imperfectly understood by a large proportion of those to whom the care of the highways is committed, it is impossible to compare the past and present state of roads without feeling grateful for their improvement, and observing in how great a degree that improvement has benefited the agricultural, commercial, and moral interests of the community.

Designing a Line of Road; Earth-works, &c.—Though formerly little attended to, the design of a line of road is a subject which requires extensive knowledge and mature deliberation. It is often advisable to survey several different lines, in order to the selection of that which, on careful comparison, appears to have the preponderance of desirable qualities. To be theoretically perfect, a road should combine the qualities of straightness and level, and its surface should be smooth and hard; and the best road, practically, will be that which makes the best compromise between unavoidable deviations from this theoretical perfection. It may be observed however that although some writers speak of the absolute perfection of each of these qualities as essential to the idea of a good road, it may be questioned whether it is desirable of any, excepting the first. Of these qualifications the two first belong to the design or laying out of the line, and the last two to the execution of the road and the materials made use of.

The qualities of straightness and level, or the *line of direction* and *line of draught*, should be very carefully adjusted to each other. Some remarks on this subject will be found in the article RAILWAY, p. 250, which apply equally to the laying out of common roads, though the proportionate retardation due to a given ascent is very different, owing to the great comparative resistance of a common road. Among the circumstances that may authorise a deviation from the straight line, are the power of obtaining suitable materials for the road, avoiding valuable property or difficult ground, and including towns or villages in the route.

It seems to be a prevailing opinion with modern engineers, that the line of direction has not generally been made as subordinate as it should be to the line of draught; and it will be well to remember, in laying out a new road, that while the effect of gravity must ever remain the same, the resistance occasioned by imperfections in the road and carriages will be reduced by every prospective improvement in their construction; thereby increasing the *proportionate* effect of gravity, and making the line of direction still more subordinate to that of draught, or, in other words, increasing the length of level road that may be traversed with the same expenditure of power as would raise the load up a given elevation. Curves increase the resistance to the motion of carriages, and add to the risk of accident; but if slight, they increase the length of the road much less than might be supposed. Edgeworth, in his 'Essay on the Construction of Roads and Carriages,' says, 'A road ten miles long, and perfectly straight, can scarcely be found anywhere; but if such a road could be found, and if it were curved, so as to prevent the eye from seeing farther than a quarter of a mile of it, in any one place, the whole road would not be lengthened more than one hundred and fifty yards.'

The principle explained in p. 250 of the article RAILWAY, of so arranging the inclinations on each side of the summit, or highest point unavoidably passed over, that there may be no unnecessary rise and fall, is equally deserving of attention in the design of a common road, although it has been much neglected. The following statement respecting an old road in the Isle of Anglesey, which was altered by Telford, shows how very much a road may be improved by judicious alterations; not only by shortening the line and lowering the summits, but also by diminishing the minor undulations:—

	Summit above high water.	Total rise and fall.	Length.	
			Miles.	Yards.
Old road .	339 feet	3,540 feet	24	428
New road .	193 „	2,257 „	21	1,596
Difference .	146 feet	1,283 feet	2	592

However desirable a perfect level may be in theory, a road with moderate inclinations, as of 1 in 100, is found to be preferable in practice, because without such a slope it is difficult to get rid of water fast enough, unless the road be raised a few feet above the surrounding land, and thereby exposed to the free action of sun and wind. Slight undulations are also considered, by most authors, to be desirable in all cases where animal power is employed; frequent changes in the amount of exertion being considered favourable to the horses. On this principle it is recommended that where an undulating road is reduced to a uniform gradient, occasional levels should be introduced to ease the draught. Any inclination exceeding the angle of repose, or that beyond which a carriage would roll down by its own gravity, occasions a loss of power: but all below it are attended with a compensating effect when the traffic in both directions is taken into account: the advantage gained by descending carriages being equal to the additional labour required in the ascent. This angle has been stated by Lardner to be about 1 in 40, with a good carriage on a broken stone road of the best quality; but the inclination allowed on the Holyhead road is 1 in 35, a slope which may be ascended at a good rate of speed, and descended at twelve miles an hour without risk. A greater slope not only occasions much additional resistance in the ascent, but, by rendering it unsafe to drive down at full speed, causes a loss of time in the descent also. Modern engineers consider it unadvisable in any case to exceed an inclination of 1 in 24, though there are hills at least twice as steep on some turnpike roads. The following table shows the effect of various inclinations in increasing the draught of a stage-coach at different velocities on the same description of road, as indicated by a dynamometer contrived by Mr. Macneill for experiments on the draught of carriages:—*

	Force required at		
Inclination.	6 m. p. hour.	8 m. p. hour.	10 m. p. hour.
1 in 20	268 lbs.	296 lbs.	318 lbs.
1 .. 26	213 ..	219 ..	225 ..
1 .. 30	165 ..	196 ..	200 ..
1 .. 40	160 ..	166 ..	172 ..
1 .. 600	111 ..	120 ..	128 ..

It should always be borne in mind that the occurrence of one steep hill on a line of road affects the working of the whole line, as the number of horses required for ascending it must be used, although a portion of their power may be unemployed on the greater part of the road. The inconvenience of a steep inclination may be diminished by laying a stone tramway for the use of ascending vehicles; a measure which has been adopted with success on the Holyhead road, where, on a slope of about 1 in 20, the power required to draw a ton has been reduced by this means from 294 lbs. to 132 lbs.

In arranging the works necessary for obtaining the required level, the preference should be given to embankments; and, wherever it is practicable, the bed of the road should be elevated two feet above the natural level, for the sake of efficient drainage. Tunnels are very rarely introduced on common roads, being very costly, and, when of considerable length, inconvenient from their darkness. When the road is in an excavation, the side-slopes should never be steeper than two horizontal to one vertical, and it is desirable to have those on the south side three to one; because, though many materials will stand at steeper inclinations, it is essential to the preservation of the road, and the comfort of horses travelling upon it, that the sun and air should have free access to its surface. Where stone can be readily procured, the erection of walls at the bottom of the slopes gives a neat and finished appearance to the road, and prevents earth, which may be loosened from the sides, from falling into the side channels or drains. The Highgate Archway road affords an example of the great difficulties that occasionally attend a deep excavation, owing to the accumulation of water; the remedy for which is described hereafter. Where embankments are required, strong fencing is especially necessary, to guard against the occurrence of accidents. Some of the roads formed by Telford are conducted across deep valleys by bridges or viaducts of great magnitude, in order to maintain the desired level without the inconvenience and expense of large earth embankments.

In old roads the bridges erected for the passage of rivers are frequently made much smaller than is advisable, so that the level of the road is made too low, and the water is impeded by the contracted arches to such a degree as to occasion much damage during floods. Modern engineers, b adopting bolder dimensions for the bridges, and formin raised approaches, avoid these inconveniences, and secu their roads from the risk of obstruction by floods. Th raising of the road wherever it passes through marshy o low land is a very necessary measure. Many old road still in use are sunk several feet below the surface of th ground, because they have originally been exposed to th destructive action of water, and the materials thus softene have been ground into mud and cleared away, until, b the repetition of these operations, the roads have been converted into deep trenches, which are frequently floode in winter. Of the extent to which this process has bee occasionally suffered to go on, an idea may be formed fro the statement of Edgeworth, that 'the stag, the hound and the horsemen have been known to leap over a loade waggon in a hollow way, without any obstruction from th vehicle.'

In conducting a road through a mountainous district, i addition to numerous bridges for the purpose of crossin ravines (for which purpose suspension bridges have bee occasionally applied, as in the passage of the Menai strait embankments between retaining walls of stone, and wall to support the road along the face of a precipice, are fr quently necessary. Some works of the latter charact have excited much admiration. If the slope of a precipi be only six inches horizontal to a foot vertical, such a ro may be formed by building a wall thirty feet high, base on steps cut into the rock, and cutting into the rock to th depth of ten feet on a level with the top of the wall, th space between which and the face of the precipice is fille in with earth or stone. By this means a platform twent five feet wide is obtained. Many works of this ch racter have been executed by Telford and other engineer in various parts of Scotland, in the Highland roads, an those forming the communication between Edinburgh an London: and others, the boldness of which commands un versal admiration, occur in the great mountain-passes the Simplon and Mont Cenis, which form imperishab monuments of the talent and energy of the engineers Napoleon, by whom they were executed.

When the works are completed to the proper level f receiving the hard materials that form the surface of th road, the earth should be formed into the intended wid and a nearly level surface, the footpath or paths bei elevated a few inches above the bed of the carriage-wa Thirty feet is the ordinary width of the carriage-way, e clusive of footpaths, of the Holyhead road; but owing to th diminution of traffic since the opening of the London a Birmingham railway, a recent Report suggested the proprie of reducing the width, in most places, to twenty-four twenty-five feet. This width may be more or less exceed in the vicinity of large towns, according to the amount traffic, but should be exactly adhered to in other situatio as uniformity in this particular greatly improves the a pearance of a road, and also contributes to economy, bu as to the land and materials, and the cost of maintenan Some engineers recommend that the bed should be ma convex, in the same degree as the finished surface of t road; but it is quite flat in the Holyhead road, by whi means a greater depth of materials is allowed in the cent than at the sides of the road. Much has been said on t subject of the best form for the transverse section of road. Formerly it was common to make it very conv often to a degree that was highly dangerous, with the id of throwing off water: but this notion is very fallacio because if a road be allowed to wear into ruts, no deg of convexity that can be given is sufficient to k it dry; while, if the surface be good, a very moderate slo is sufficient to carry off water, and a steep inclination w cause it to run with such velocity as to wear away t road materials. Another disadvantage of too great an clination is, that, by throwing the weight of a carriage one side, the vehicle itself is injured, and the overload wheels cut up the road more than necessary. Some ha gone so far in opposition to this practice as to advocate p fectly flat or even concave roads, in favour of both which much may be said: but the general practice of m dern roadmakers is to make the surface slightly conv In Telford's roads the convexity is elliptical, the fall bei half an inch at four feet from the centre, two inches at feet, and six inches at fifteen feet. It has been recommended to form the cross section into three flat planes, that in the centre being horizontal, and the others slightly inclined from it. Very narrow roads are often sloped in one direction only, like one-half of a convex road; and roads on the face of a steep hill are occasionally treated in this manner, the surface water being conducted towards the hill, and carried off by drains under the road. This plan has the advantage of checking any tendency in carriages to roll or turn over towards the least protected side of the road.

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* This useful instrument, which its ingenious inventor denominates a *Road Indicator*, is mounted in a light phaeton, and besides marking the draught at every ten or twenty yards, points out the distance run, and the rates of acclivity or declivity on every part of the road. A full description of it is given in Parnell's 'Treatise on Roads.'

Wherever the substratum of a road is wet and soft, great care is necessary to make the bed solid. If the ground be boggy or marshy, it is desirable to form an embankment of sufficient thickness to compress the elastic foundation; such embankment being sometimes supported by faggots. Telford and most engineers recommend that ramming with stone-chips should be resorted to where the bed is wet and spongy; and that where soft clay occurs, a stratum of earth should be laid between it and the road materials, a precaution which tends to diminish the injurious effect of frost on a road with a clay bottom. Though great care is usually considered necessary in order to obtain a firm foundation, M^c. Adam and some others have not only contended against its importance, but actually preferred, in certain cases, a yielding substratum to one of rock, on the supposition that the wear of the road is diminished by elasticity. Careful observations on the repairs of a road in Somersetshire, of which about seven miles are supported by a morass, and five or six by limestone rock, indicated a difference of expense in repair of about five to seven in favour of the morass, though it was so soft that the vibration caused by a carriage passing was sufficient to break the young ice in the side ditches; but extended experience seems to confirm the more general opinion in favour of a hard unyielding foundation.

Deep ditches should be cut for the efficient drainage of the road, which is of paramount importance; and these should be on the field side of the fences. They should extend to a depth of from two feet six inches to four feet below the bed of the road, according to the nature of the ground. The earth thrown out from them is commonly used in forming banks for the hedges; but in wet soils, where the ditches are made larger and deeper than usual, the additional earth excavated is applied to raising the bed of the road. Where brick- or stone-covered drains are substituted for open channels, it is usual to build them with open joints, to allow the passage of water through the sides. Cross-drains of masonry are introduced at intervals to connect the side channels, and numerous minor drains filled with rubble stones or clean gravel are formed in the bed of the road. The latter are frequently of the kind called mitre-drains, which are made V shaped in plan, diverging from the centre of the bed, and extending diagonally to the sides, their angle being regulated by the longitudinal slope of the road, so that their inclination may not exceed 1 in 100. These may be placed about sixty yards apart, or closer in wet soils, and they receive the water that filters through the surface materials. In cuttings or excavations it is advisable to make drains to catch the water descending from the sides, and prevent its reaching the surface of the road.

In treating of the choice and application of the hard materials which compose the surface of the road, the formation of *metalled* roads, or those made of broken stone and similar materials, will be first considered; and afterwards that of the principal varieties of pavement.

Metalled or Broken-Stone Roads.—In the formation of metalled roads the system adopted in the great works of Telford and his followers is that most decidedly sanctioned by experience. The distinguishing feature of this system is the use of a rough pavement of hand-laid stones on the bed of the road, to support the small broken stone of which the surface is composed. In the very imperfect mode of road-making formerly practised (which scarcely deserves the name of a system), it was very common to cover a bad road with a large quantity of stones, often unbroken, and generally of very irregular dimensions. These stones, owing to their rounded form and the softness of the substratum, never consolidated into a hard surface, and in course of time sunk into the soft earth beneath, which worked up among the stones in the form of mud. Thus enormous quantities of stone were used without producing a good road, the stone sinking into the earth to a surprising extent. This evil is greatly diminished by good drainage, and by the use of stones of uniform size broken into angular pieces, which have a tendency to lock together into a hard and compact mass,—a fact of the highest importance in the science of road-making, and which appears to have been first prominently brought forward by the late Mr. M^c. Adam. A great extent of excellent road has been made on the plan advocated by M^c. Adam, who considered paving unnecessary, and laid the broken stone immediately on the surface of the earth, depending on its forming a hard crust impervious to water; so that the earth, being always kept dry, may have no tendency to work up among the metal or broken stone. M^c. Adam used no stones exceeding six ounces in weight, and gave the preference to those of about one ounce, or an inch diameter, which he spread over the road in thin layers, each being worked over by carriages till in some degree consolidated; and he objected to the use of chalk or earth mixed with the stone for the purpose of binding it together. He considered a thickness of ten inches of broken stone, well consolidated, to be sufficient for bearing any load, even where the foundation is a morass, in which case he considered no intermediate substance necessary. Near Bristol a road in which the metalling had worn down to a thickness of only four inches, was found to have kept the substratum of earth perfectly dry. But, satisfactory as this plan of road-making has proved in some cases, there are others in which it has failed, and some in which a very large quantity of stone has been applied before a firm road could be obtained. A road from Lewes to Eastbourn, made on Mr. M^c. Adam's principle, is said to have required three feet of materials in many parts before it was consolidated, though it was ultimately brought into a good state.

The system of pitching or paving the bottom of a road has the advantage of preventing the subsoil from working up among the road materials, and, when well executed, of distributing the pressure of carriages over a larger base; while the size of the paving stones themselves prevents their sinking into the earth, as small stones are liable to do. The pavement also acts as a drain to the surface materials. In addition to these, the plan has, in many situations, the advantage of economy, as the cost of a pavement is considerably less than that of an equal depth of well-broken stone. In most, if not all, of the cases in which the paving system has failed, the want of success may be attributed to very imperfect execution; as, if the stones are very irregular in size or badly set, or the thickness of metal is insufficient to protect the pavement from the shake of passing carriages, the stones become deranged, and the subsoil, working up among them, quickly spoils the road.

The case of the Highgate Archway road, which has been before alluded to, is a remarkable illustration of the absolute necessity of a firm bottoming under some circumstances This road is over a subsoil of sand, clay, and gravel; and being partly in a deep cutting (originally intended for a tunnel), is much exposed to the influx of water. The road, which is rather more than a mile and a half long, was originally made of a quantity of gravel and sand laid on the natural soil, and covered with broken flints and gravel; but this plan not succeeding, the road was taken up, and pieces of waste tin were laid on the subsoil, over which were spread gravel, flints, and broken stone. This expedient did not produce the desired effect, and at length, in 1829, the road was placed under the management of the Holyhead-road Commissioners, its proprietors having failed, notwithstanding an enormous outlay, and the application of 1200 cubic yards of gravel annually, to bring it into a satisfactory state. A thick coat of broken granite was spread on a portion of the road; but owing to the unsoundness of the foundation, it never consolidated, the stones wearing into smooth pebbles by their attrition against one another, even down to the bottom of the mass. The commissioners therefore determined, as paving-stones could not be procured without great expense, to lay a coating of Roman cement and gravel as a bed for the road-metal, an experiment that has been attended with complete success. The work was executed by Macneill, and consists of a composition of Roman cement with eight times its quantity of washed gravel and sand, which, after being mixed in a box, was laid on the bed of the road to a thickness of six inches and a width of about eighteen feet. A few minutes after being laid, the upper surface was indented, by means of a triangular piece of wood sheeted with iron, with numerous channels or grooves, sloping about three inches from the centre to the sides; these channels serving for the stones to lie and fasten in, and conducting any water that might percolate through them into the side drains. This measure, combined with an extraordinary extent of drainage, amounting in the whole to a length of 12,803 yards, proved so complete a remedy, that in the first winter after the cement was laid, coaches were able to go up with four horses at a trot with the heaviest loads, though before the improvement six horses had mounted with difficulty at a walking pace. The effect of the alteration on the wear of the road was equally satisfactory, four inches of quartz being worn away on the old bottom while only half an inch of the same stone was worn where laid on the cement foundation. The expense of laying the cement composition, including the formation of the bed of the road, was about ten shillings per lineal yard, part of the gravel used being old. Macneill estimated the cost at from twelve to fifteen shillings per yard if new gravel were purchased.

The effect of a paved or concrete foundation in diminishing the draught appears, from the subjoined statement, founded on experiments with Mr. Macneill's road indicator, to be very great; but a more extensive series of trials is desirable for a comparison of different systems under various circumstances. The draught of a waggon weighing 21 cwt. was found to be as follows:—

On a well-made pavement	33 lbs.
On a road with six inches of hard broken stone on a rough pavement	46
On a similar road, with a foundation of Roman cement and gravel in lieu of pavement .	46
On a road with a thick coating of broken stone on earth	65
On a road with a thick coating of gravel on earth	147

For the formation of the pavement of a metalled road, almost any hard stone that may be easily dressed with the hammer may be used. The stones should be tolerably regular in size, and laid in rows with their broadest face downwards, the interstices being carefully filled up with stone-chippings, so as to pin the whole pavement together, and effectually prevent the earth from working up through the joints. In one of Telford's specifications for the Holyhead road the dimensions of the stones for a pavement thirty feet wide are given as seven inches deep in the middle of the road, five inches at nine feet from the centre, four inches at twelve feet, and three inches at fifteen feet, the stones to be laid lengthwise across the road, and the upper edge in no case to exceed four inches wide. All irregularities are to be broken off by the hammer, and the stone-chips used in packing the joints are directed to be wedged in by hand or with light hammers. No ramming is necessary, and it is desirable to prevent carts which are used in the conveyance of the road materials from being drawn upon the pavement before it is covered with broken stone.

Some road-makers use a pavement even on a substratum of rock, where it is uneven, but in many cases it is unnecessary; although, if the surface be smooth, it should be picked to a degree of roughness similar to that of a pavement, in order that the road materials may not slide upon it. Where paving the whole width of a road might be too expensive, the pavement is sometimes limited to a width of sixteen or eighteen feet in the centre. In situations where coarse stone of suitable quality can be easily procured, it is found to be cheaper to make a road with six inches of broken stone and a pavement, than with ten inches depth of broken stone without paving. Mr. Wingrove, surveyor of the Bath roads, mentions the use of freestone brash, chalk, &c. for forming the foundation pavement of metalled roads.

The quality and right application of the road-metal, or broken stone which forms the surface of the road, is of great importance. As a general rule the hardest stone is to be preferred, but this rule admits of some qualification, some very hard stones being found to wear much more rapidly than others of a softer but tougher quality. According to Parnell, whose experience renders him a good authority, the best descriptions of road materials 'consist of basalt, granite, quartz, syenite, and porphyry rocks. The whinstones found in different parts of the United Kingdom, Guernsey granite, Mountsorrel and Hartshill stone of Leicestershire, and the pebbles of Shropshire, Staffordshire, and Warwickshire are among the best of the stones now commonly in use. The schistus stones will make smooth roads, being of a slaty and argillaceous structure, but are rapidly destroyed by wet, by the pressure of wheels, and occasion great expense in scraping and constantly laying on new coatings. Limestone is defective in the same respect. It wears rapidly away when wet, and therefore, when the traffic is very great, it is an expensive material. Sandstone is much too weak for the surface of a road; it will never make a hard one, but it is very well adapted to the purpose of a foundation pavement. Flints vary very much in quality as a road material. The hardest of them are nearly as good as the best limestone, but the softer kinds are quickly crushed by the wheels of carriages, and make heavy and dirty roads. Gravel, when it consists of the pebbles of the hard sorts of stones, is a good material, particularly when the pebbles are so large as to admit of their being broken; but when it consists of limestone, sandstone, or flint, it is a very bad one; for it wears so rapidly that the crust of a road made with it always consists of a large portion of the earthy matter to which it is reduced. This prevents the gravel from becoming consolidated, and renders a road made with it extremely defective with respect to that perfect hardness which it ought to have.' Mr. Stevenson, in the article 'Road' in the 'Edinburgh Encyclopædia,' states the distribution of road materials in the British islands to be partial and irregular. 'Throughout Scotland, and even as far south as the approaching sources of the rivers Tees and Ribble, good road-metal is generally to be met with, containing the numerous varieties of granite, greenstone, basalt, porphyry, and limestone. South of this boundary, as far as the Trent and the Dee in Cheshire, the formation is chiefly coal, sandstone, and the softer varieties of limestone. In the southern counties chalk and gravel soils chiefly occur, affording flint and gravel, both of which, under proper management, make excellent roads. In North and South Wales we have all the varieties of road-metal which are common to Scotland. In Ireland they have excellent road materials, as granite and limestone are pretty generally distributed.'

An interesting experiment has been tried on a part of the Holyhead road between London and Birmingham, as to the effect of iron amongst the road-metal in diminishing the wear of the road. The iron is cast in the form of cubes, about an inch square, and when the road was consolidated, holes large enough to receive them were picked in its surface. A single cube was then placed in each hole, so as to be level with the road, and the small stone-chips were beat down about the iron with a mallet. One of these iron cubes is placed in every four inches of surface. They very soon become firmly imbedded, so as not to be disturbed by the rolling of carriages or the feet of the horses; and to assist their consolidation, it is recommended to water the road freely, if the cubes are inserted in dry weather. The iron was applied in March, 1835, since which time the portion of road in which they are used has continued in excellent repair, and the wear is so materially diminished, that a more extended trial of the plan appears highly desirable. Mr. Macneill, the patentee of this method of road-making, considers it particularly applicable to streets, on account of its durability, and thinks that the expense would be trifling, as iron of the worst quality may be used. It may be observed that the draught on the piece of road on which the experiment is made is very easy, and that horses do not show any tendency to slip upon it.

In the choice of materials, the expense of conveying them to the road must be taken into consideration, but it is often better economy to fetch good stone from a great distance than to use that which is less durable, though readily procured; as, in addition to the expense of frequent repairs to a road formed with weak materials, great additional labour is imposed upon the horses, which have to wear down repeated coats of fresh stones. This is one of the points in which the inexperience and ignorance of road surveyors have often been displayed, cases having occurred in which an inferior material has been procured from a distance at great cost, while stone of excellent quality existed in abundance on the spot.

With regard to the best size of the broken stone for the surface of a road, both Telford and Mc. Adam direct that no piece should exceed six or eight ounces in weight. In some districts the surveyors have been instructed to test etal by a pair of scales and a six-ounce weight; but a usual test is an iron ring two inches and a half in ter, attached to a handle, through which every stone l be small enough to pass. Some writers have recomed that one inch should be the maximum diameter, is only the hardest and toughest materials that will reaking so small without much waste. The pieces l be as nearly cubical as may be, and should on no nt be broken on the surface of the road; nor is it well it on the heap, the best method being to break one or eces at once on a large block of hard stone, the pieces held steady by the iron ring that serves as a gauge. ing posture is considered best for those engaged in ing road-metal, an operation which, under the modern n of road-making, gives employment to a great num- hands. Attempts have been made to perform this tion by machinery, but mechanical contrivances have een found equal to manual labour. Pronged shovels ade use of in lifting the broken stone into barrows arts, as they save labour by entering the heap with less nce than ordinary shovels, and also prevent the adre of earth with the metal.

depth of metal on a paved foundation should be not less ix inches, and it should be laid on in two or three distinct ,carefully spread with broad shovels, and carriages should on each till it is in some degree consolidated before er is laid over it. While the metalling is fresh, men l attend to rake in the ruts as fast as they are formed, pick off any large stones that may have previously d notice, as they are sure to work up to the surface. les of the road may be covered with the smaller por- the metal, separated by a sieve with meshes of an quare; and a layer of about an inch and a half of clean is occasionally added over the whole surface in order the draught while the road is new, though its effect road is rather injurious than otherwise, nothing needed to bind the metal together. Rolling a road ich fresh materials have been laid is a measure of ul utility, the most effectual consolidation being pro- by the working of carriages which are compelled to eir tracks, and to run on the new metal, by placing trestles across the road, and altering their position necessary; the road is frequently raked as long as ose stones remain.

ere the traffic is not sufficient to justify so expensive e of formation as that which has been described, good nay be formed with broken stone only, increasing in ess from six inches at the sides to twelve inches in tre. If nothing better than gravel can be procured, l recommends that a coat of four inches be laid on epared bed, and worked over till pretty firm; then a three inches thick, once screened, and finally three t layers of the gravel well riddled, and free from earth, r stones exceeding an inch and a half diameter; the when completed, to be ten inches thick at the sides, xteen in the centre, where the strongest and best the gravel should be laid. The drainage must be larly attended to in a gravel road. Among the in- materials occasionally used is limestone burnt to a s state; but, though formerly often used in districts coal is abundant, it is not approved for carriage- y modern road-makers.

ompleting a road it is necessary to form the side ls with care, and to provide against their being in- d with by branch or field roads. The footpath, which lly about five feet wide, may be made of gravel or sandstone, and is required in the Holyhead-road ations to be level with the centre of the road, which nches above the sides. For fencing, walls are pre- where stone is plentiful, as they occupy less space edges, and have a neat appearance. If the stone is urable shape, such walls may be built without mortar, in the coping; but if on the side of an embankment, lls should always be strongly built with mortar. A bank and ditch occupy a width of about eight feet in y cases, and the young quicks are protected by post l fencing; but where timber is scarce, it is sometimes make the ditch and bank rather larger, so that the railing may be dispensed with. In cuttings and ther situations a mound or bank without a hedge convenient fence, and these, as well as hedge-banks, improved in appearance and durability by being d. All fences should be kept low, that they may not exclude sun and wind; and for the same reason trees or buildings that overshadow the road should be removed when practicable. The situation of toll-gates must be regulated by circumstances, but it is very desirable to avoid placing them either on or at the bottom of a hill, an arrangement very liable to cause accidents. The gates, which, when single, may be fifteen feet, or, when double, without a centre-post, twenty-four to thirty feet wide, are usually painted white, that they may be readily seen at night. They should be well lighted, and supplied with comfortable toll-houses, which, on some of the modern roads, are erected in an ornamental style. Parnell advises the use of milestones of light-coloured stone, and of larger dimensions than usual; but cast-iron posts have been extensively used, and on some roads cast-iron tablets mounted on stone. A convenient arrangement is a stone or post with two tablets inclined towards the road, so that persons travelling in either direction see the distance of the town which they are approaching.

However well a metalled road may be made in the first instance, its preservation in a good state depends greatly on prompt and judicious repair. The mud that forms on the surface in wet weather should be scraped off and formed into heaps at the side (avoiding the side channels), until it is sufficiently dry for carting away; because, if left on the surface, it would while moist soften the road and cause it to break up, and after drying impede the running off of water from a subsequent shower. This operation has been usually performed by hand, but scraping-machines, patented by Messrs. Bourne and Harris, have been recently introduced with success, they being found to diminish the labour fully one-half. The winter season, from October to April, is considered the best time for the addition of fresh materials, which are laid on in thin coats, and should always be applied as soon as any hollow capable of retaining water is observed. For the purpose of keeping a supply of broken stone always at hand, depôts for holding about twenty-four cubic yards of metal are formed by the road-side, at intervals of a quarter of a mile or less, from which the stone is taken to the required spot in barrows. When laid on the road, according to Parnell, it is not necessary to pick up the old surface, as the new metal keeps the part under it wet and soft, and soon works in. Mc. Adam, however, recommends breaking up the surface of the road in every case where fresh stone is added.

Stone and Iron Tramways.—Though an improvement on ordinary pavement, this description of road may be considered as a link between metalled and paved roads, stone tracks having been occasionally applied to common roads, and with great benefit. Stone tramways consist of wheel-tracks formed of large blocks of stone, usually granite, the surface of which is made so smooth as to offer very little resistance to the rolling of the wheels, while the space between the tracks, being composed of broken stone, gravel, or rough pavement, affords secure footing for the horses. Iron tramways, in which cast or wrought iron plates are used instead of blocks of stone, have hitherto been very little used on ordinary roads, though their superior smoothness gives them a decided advantage, while their expense does not, as stated by Macneill, at all exceed that of granite. Iron tracks are sometimes made with a flat surface, but a slight concavity, as shown in the section of Woodhouse's rail in the article **Railway** (p. 246), tends to keep the carriages more accurately in the right course, and is therefore an advantage when all the vehicles used on the tramway are nearly uniform in width. The granite blocks used for stone tramways are generally from three to six feet long, twelve to eighteen inches wide, and eight to twelve inches deep. Great care is necessary in bedding such large blocks, and the joints require nice adjustment. They are frequently laid end to end without any fitting into each other, but it has been proposed to dovetail the ends together, to insert a small stone as a dowel between two blocks, to use iron clamps, or to join the stones with oak tree-nails. The granite tracks used on some steep ascents in the Holyhead road are bedded on a pavement eight inches thick, packed and grouted, and a layer of three inches of broken stones not exceeding an inch and a half diameter; a thin stratum of gravel, well rolled, being placed last of all to receive the blocks. When they are laid, the centre and side spaces are filled up with ordinary road material to the level of the tracks; a row of common granite paving-stones, about six inches deep, five wide, and nine long, being laid along each side of the tracks to prevent loose materials working on to them. Mr. Stevenson, in the 'Edinburgh Encyclopædia,' recommends the use of smaller stones, as being cheaper and less liable to injury from vibration than those of the usual size. The dimensions recommended by him are fourteen inches deep, eighteen inches wide at the base, twelve inches wide at the top, and six to nine inches long. The increased accuracy required in the numerous joints might probably counterbalance any advantage gained by the adoption of small stones.

The great saving of power effected by the use of tramways for ordinary carriages is shown by numerous experiments, some of which, tried on the granite tracks of the Commercial Road in London, proved that a well-made waggon will run with increasing velocity, by the force of gravity alone, down a mean slope of 1 in 155. On this road a loaded waggon weighing ten tons has been drawn with apparent ease by a single horse, up an ascent of 1 in 274, for a distance of about two miles. On an iron tramway laid in 1816 by the Forth and Clyde canal company at Port Dundas, near Glasgow, a horse has taken a load of three tons on a cart weighing nine cwt., up an acclivity of 1 in 15, without difficulty, though he could not proceed with it on a common causeway with an easy line of draught; and the carters agree that the horses take up three tons on the iron tracks as easily as they did twenty-four cwt. on the common causeway previously used.

In order to ascertain the comparative durability of different kinds of stone for tramways, and for paving generally, Mr. Walker tried some experiments on blocks laid in a toll gateway on the Commercial Road tramway, the results of which were as follows:—The blocks were eighteen inches wide and twelve deep, and were laid down in March, 1830; and the loss given in the table was ascertained after they had been in use seventeen months, in August, 1831:—

Description of Stone.	Loss of depth. Absolute.	Loss of depth. Comparative.
Guernsey	·060 in.	1·000 in.
Herm*	·075	1·190
Bullet†	·082	1·316
Blue Peterhead . . .	·131	2·080
Heyton	·141	2·238
Red Aberdeen . . .	·159	2·524
Dartmoor . . .	·207	3·285
Blue Aberdeen . . .	·225	3·571

Stone tramways have been adopted in many street pavements where a great traffic is carried on, particularly in some of the narrow streets in the city of London, with much advantage; but their application to acclivities on ordinary roads has hitherto been more limited than their merits deserve. By their judicious introduction on a few steep inclinations, many hilly roads might, at a small expense, be made nearly equal to level lines; and it is probable that such a measure would tend, in an important degree, to enable turnpike-roads to meet the formidable rivalry of railways. In his report to the Holyhead-road Commissioners in 1839, Mr. Macneill strongly recommends the application of stone or iron tracks to several hills, and states that an iron tramway laid down along the whole length of the road would reduce the expense of horse labour fully one half. 'If,' he writes, 'a tramway were constructed of iron plates, the whole way from London to Birmingham, a coach carrying sixteen passengers might be drawn at the rate of ten miles an hour with only two horses, and one horse would be able to draw a post-chaise more easily than two now can, so that the expense of travelling might be reduced one half, and a similar reduction might be made in the charges for carrying goods. The expense of forming such a railway would be about 2500*l*. a mile, making the whole expense from London to Birmingham 271,000*l*.' In addition to the immediate advantages of such an improvement, it would remove one of the greatest obstacles to the successful use of steam locomotives on common roads.

Pavements.—The formation of paved roads on correct principles appears to have been well understood by the Romans, whose pavements show great care in their essential features,—a good foundation and accurate fitting of the stones. Some of the modern imitations of the Roman system in the street-pavements of Italy show the like attention to these important points, the paving stones being set in mortar on a concrete foundation with a degree of accuracy that has led some writers to designate these roads *horizontal walls*. In some instances the blocks of stone used are of considerable depth; but they are often thin, and, being of large dimensions, have more the character of flag-stones than of ordinary paving-blocks. At Naples and Florence, stones two feet square and six inches thick, laid diagonally across the road, and neatly set in Pozzolano mortar, are used: the surface being chipped where declivities or turnings occur, to prevent the slipping of horses, which become very sure-footed from habit. Occasionally, as at Milan, different kinds of paving are laid for the wheel-tracks and horse-path, so as to produce the effect of a stone tramway. These pavements have been recommended as models for imitation in paving the streets of London: but the durability with which they are constructed would form a disadvantage in a place where the pavement has to be frequently disturbed for the purpose of laying down or repairing water and gas-pipes, or cleansing the sewers: and it is probable that pavements which answer well for the light vehicles and limited traffic of many of the continental cities, would be found quite inadequate to bear the number of heavy carriages traversing the principal thoroughfares of the metropolis: of which some idea may be formed from the fact that upwards of 11,600 vehicles were observed to pass along King William Street, near London Bridge, on the 12th of August, 1840, between the hours of eight A.M. and eight P.M., being at the rate of more than fifteen per minute for twelve hours.

Another description of paved road, the origin of which is commonly referred to the Romans, is the *chaussée*, or roughly-paved causeway used in the principal highways of France and some other parts of the Continent. This kind of road has been much recommended for its durability when well made, but, unless laid with a degree of care that would render it too expensive for general adoption, it causes a very unpleasant and fatiguing jolting. In such roads the pavement usually covers only a part of the breadth of the road, leaving the sides available for the use of light carriages in dry weather; and it has been suggested, that where the width of the roadway would allow, it might prove advantageous to form, in all great roads, a track of pavement or hard broken stone for winter use, and another of inferior materials for the summer, both to save the wear of the hard road and increase the comfort of passengers. Such an arrangement is convenient in the principal approaches to great towns, where it is considered best to have the pavement at the sides, that carters may walk either on or near the footpaths, and that foot-passengers may not be incommoded by the dirt of the metalled road.

In Holland, pavements of brick, which are also probably derived from the practice of Roman engineers, are extensively used, not only for footpaths, but also for the passage of light vehicles, which run on them with great facility. The bricks used for this purpose are thin, and well bedded in lime.

Common stone pavements are, by most writers, divided into two classes: *rubble* causeway, in which the stones are of irregular shape, and very imperfectly dressed with the hammer; and *ashler* causeway, which is formed of stones of larger size accurately squared and dressed. In both kinds the excellence of the pavement depends greatly on the firmness and evenness of the bed, and the careful fitting of the stones to each other, which may be accomplished with very irregular stones by judicious selection. If one stone be left a little higher or lower than those adjoining it, or if it become so in consequence of defective bedding, the jolting of carriages in passing over the defective place will quickly damage the pavement; the wheels acting like a rammer in driving the depressed stones deeper into the earth, while the derangement of the lateral support that each stone should receive from those adjoining it, occasions the dislocation of the pavement to a considerable distance, and the consequent working up of the earth through the disturbed joints. Defective joints form another fruitful source of injury and inconvenience both to the pavement itself and to the vehicles jolted over it. If, as is often the case in inferior pavements, the edges of two adjoining stones do not meet with accuracy, narrow wheels will have a tendency to slip into the joint, and by doing so, to wear the edges of the stones, till, as may be frequently seen, the surface of each stone is worn into a convex form that renders the footing of horses insecure, and causes the motion of vehicles drawn rapidly over them to consist of a series of bounds or leaps from one stone to another, accompanied by a degree of lateral slipping highly injurious to the carriage, while the irregular percussion produced tends greatly to the destruction of the pavement.

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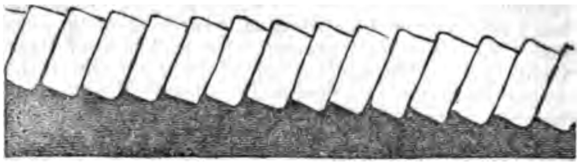
* Herm is an island adjoining Guernsey.

† A whinstone from Northumberland. All the rest are granites.

In order to procure a firm foundation, and to prevent earth from working up between the stones, it is advisable in the first instance to form a good carriage-way of gravel or broken stone, and to allow it to be used by carriages till consolidated, before laying the pavement. This plan is stated by Edgeworth, in his 'Essay on the Construction of Roads and Carriages,' 1817, to have been practised successfully by Major Taylor, of the Paving-Board, in some pavements in Dublin, and it is strongly advocated by more recent road-makers. Where broken stone is laid to a considerable depth, it should, as in the case of metalled roads, be applied in thin layers, each being separately worked into a compact state. The new pavement laid a few years since in Fleet Street affords an illustration of the necessity of this precaution, as the stones were well shaped, laid, and grouted, and the earth was removed to the depth of from twelve to eighteen inches, its place being supplied by broken stone; but the broken stone, being thrown in by cart loads, and merely levelled, was not united into a compact mass, and therefore very soon gave way, causing the pavement to sink into hollows. In streets of very great traffic, it is a good plan to lay a sub-pavement of old or inferior stones, bedded on broken stone, as a foundation for the surface pavement, a measure which has been practised with advantage in Paris. The bed of the pavement should be formed into a slight convexity, the slopes being about two inches in ten feet. A thin coat of gravel or sand laid immediately under the paving blocks is of use in filling up slight irregularities in their shape, and enabling them to form a compact bed.

For the paving stones hard rectangular blocks of granite are preferred, though whinstone, limestone, and even freestone, may be used. Guernsey granite, as shown by the table in a previous column, appears to be the most durable, but it is more liable to become inconveniently smooth than some stones of inferior hardness. The stones may vary, according to the traffic, from six to ten inches deep, six to eighteen inches long, and four to eighteen inches wide; but it is very essential that the depth of all the blocks in one piece of pavement should be alike, and that where the width is unequal, the stones be so sorted that all used in one course are uniform in this particular. The accurate dressing of the stones is a point often too little attended to; and an injudicious mode of forming contracts for paving, in which the payment has been by the square yard of paving laid, has, in connection with the effect of competition in bringing prices below the remunerating point, led to the use of stones in which the base is smaller than the upper surface, and which, when laid, scarcely come in contact with each other except at their upper edges. In some pavements the stones are made smaller at the top than the bottom, the joints being filled up with stone-chips, concrete, or an asphaltic composition; and in those of the more common construction the sides of the stones are occasionally hollowed, so as to receive a small quantity of gravel or mortar, which serves as a kind of dowelling. Ramming the stones with a heavy wooden rammer is a practice that has been much recommended, and it is considered that a more efficient application of the process, by means of a ramming-machine, or *portable monkey*, would remove some of the defects arising from imperfect bedding; but when the stones are well laid, and bedded in strong mortar, as the best recent pavements are, a few blows with a wooden maul of about fourteen pounds weight are sufficient to fix them firmly heir place. Grouting with lime-water poured all over the pavement facilitates the binding of the whole together, and fills up the joints, so as to effectually prevent the working up of the substratum. The blocks are commonly laid in rows across the road, the joints in each row being different from those of the adjoining ones; but pavements of superior smoothness have been laid in courses stretching diagonally across the street, by which means all the joints are passed over by carriages with greater ease. This arrangement is particularly desirable at the intersection of streets, as it diminishes the risk of horses slipping. Longitudinal courses are objectionable on account of the tendency of narrow wheels to enter the joints. In paving steep inclinations, it is well to use narrow stones, on account of the number of cross joints; or, if large stones be used, to cut deep furrows across their surface, to afford secure footing. A plan of paving for such situations, which has been found very effectual, is represented in the annexed diagram, in

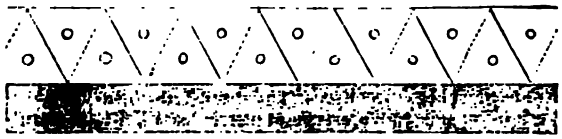


which the stones are so inclined as to present a series of steps. The chief objection to this plan seems to be the jolting caused to carriages, which produces so deafening a noise that, in a recent instance, such a pavement was taken up at the request of the inhabitants of the street. Many patents have been procured for plans of forming stone pavements in which the pressure of carriages might be simultaneously distributed over several stones, by various contrivances for dovetailing and otherwise fitting the stones together; but such plans are generally too complicated, requiring an accuracy of formation that would be very expensive, owing to the hardness of the stone. Thin blocks of stone, bedded in asphalte, have been tried, and appear to make a good pavement.

When completed, a thin coat of gravel spread over the surface is useful in diminishing the effect of the jolting of carriages on the new pavement. In case of taking up any part of a pavement to attend to water-pipes, &c., great care is necessary in relaying the part, in doing which it is well to apply some fresh broken stone to the bed, and to lay the paving stones without mortar, until the foundation is settled.

The serious defects of the common stone pavements have led to a variety of experiments on other methods of forming carriage-ways suitable for streets, of which the adoption of broken stone, or macadamised roads, has been the most general. Opinions differ widely as to the propriety of this measure, but an idea seems to be gaining ground that the comparative quietness of such a road, and its superior ease to passengers, are insufficient to counterbalance the increased draught of carriages, the dust of summer, the mud rapidly formed in wet weather, and the great expense of keeping in repair a metalled road when subjected to the constant wear of a busy town. The first cost of forming the broken-stone roads of Regent Street, Whitehall, and Palace Yard, extending to a total length of 2010 yards, and embracing 45,251 superficial square yards, was 6055*l.* 8*s.* 3*d.*, and the estimated value of the old pavement taken up and broken for the purpose was 6787*l.* 7*s.*, making a total of 12,842*l.* 15*s.* 3*d.*; and the cost of keeping them in repair for the year ending January 5, 1827, was 4003*l.* 18*s.* 4*d.*, besides 628*l.* 11*s.* for watering, making the total expense for the year 4632*l.* 9*s.* 4*d.*, or rather more than two shillings per superficial yard.

The enormous expense of maintaining some of the metalled roads in London has recently led to much attention being given to the construction of superior pavements, and various plans of paving with wood have been tried, with great promise of success. A very coarse kind of wooden road, consisting of rough logs laid close together across the track, is much used in North America, under the name of *corduroy roads*, but the wooden pavement, properly so called, seems to have been first used in Russia, and tried on a limited scale at Vienna, New York, and some other places within a few years. One of the earliest kinds used consists of blocks of fir or other wood cut into hexagonal cylinders, of six or eight inches diameter, and from eight to twelve or fifteen inches deep, and placed close together, with the grain vertically. The blocks are sometimes tarred, or may be kyanised; but even where no such precaution is used, the wear is very trifling, as the swelling of the wood from moisture makes the joints very tight and impervious to water. Such a pavement is very smooth when first laid, but, unless the foundation be very carefully prepared, it is liable to sink into hollows like the common stone pavement, owing to the want of cohesion between the individual blocks, a deficiency which it has been proposed to remedy by pegging or dowelling the pieces together, though their form is not very suitable for the purpose. Some specimens have been laid on a flooring of planks, to avoid this inconvenience. Of the numerous other plans proposed, but one has yet been tried on an extensive scale, and it appears likely, in point of smoothness, quietness, cleanliness, and ease of draught, to prove the best of metropolitan pavements. In it the blocks are sawn into a rhomboidal shape, the upper surface forming an angle of about 63° with the direction of the grain, by which the durability of an end section is in a great degree preserved, while the inclination of the sides causes each block to receive support from those adjoining it, and affords facilities for pinning the whole pavement together by pegs. The following diagram may serve to illustrate this ingenious arrangement, which is the invention of the Comte de Lisle.



The solid lines represent part of one course or transverse row of blocks, which all incline in one direction, each block having on one side two projecting pegs, and on the other two holes. The adjoining course is laid in like manner, but sloping in the opposite direction, as indicated by the dotted lines, by which disposition the two pegs on one side of a block enter two distinct blocks in the adjoining row, while the holes on the other side receive in like manner the pegs of two other blocks; so that each block is pinned to four others, besides receiving support from the adjoining blocks of its own course. Where this principle of construction is fully carried out, the whole pavement of a street becomes, as it were, one mass, being so pinned together that no block could be raised without breaking the dowels; but as it is necessary sometimes to disturb the pavement in order to get at the gas and water pipes, some specimens have been laid down in masses of twenty four or thirty six blocks, so united by iron clamps that the blocks thus connected together may be laid down and taken up, when necessary, at once. The pavement laid down on this plan in Oxford Street is all pinned together in the manner first described, and consists of blocks six inches deep laid on a well-formed concrete foundation.

As far as a judgment can be formed at present, wood pavements appear likely to prove exceedingly durable; and it is stated by Mr. Finlayson, who in 1825 suggested the adoption of wood for paving the streets of London, that a few blocks of wood placed vertically in a granite pavement were less reduced by twenty five years' wear than the stone itself. The principal disadvantage of wood appears to be its becoming slippery in wet weather, to obviate which, in some instances, the upper edges of the hexagonal blocks have been bevelled, so as to form zigzag grooves when laid down: but the most effectual plan seems to be to cut straight grooves along the centre of each block, by which the stability of the joints is not at all affected.

Another description of road that has lately attracted much attention is that consisting of an asphaltic composition. Many attempts have been made to form roads of gravel and other materials united by animal oleaginous or gelatinous substances, or coal-tar, into a kind of concrete; but such attempts have seldom proved successful on a large scale. Mineral substances of similar character have been found more advantageous, and the native asphalte procured near Seyssel, in the department of l'Ain, and some other places, has been found to produce, when mixed with a small portion of native bitumen, a substance admirably adapted for the formation of smooth roads, and a variety of other important purposes. Its application to carriage ways has been in this country chiefly confined to court-yards, for which, as well as for terraces and footpaths, it is very suitable. The asphaltic mastic of Seyssel, as prepared for use, consists of ninety-three parts of native asphalte reduced to powder, and seven parts of bitumen; the two being melted together, and a little fine gravel or sand stirred in with the mixture. The composition is ready for use when it simmers with a consistency similar to that of treacle, and it is spread while hot so as to form a coating about an inch thick upon a levelled foundation of concrete. The thickness of the asphalte is regulated by slips of wood or iron, which are often so disposed as to divide the pavement into ornamental compartments, the asphalte being made of various colours by the admixture of different kinds of sand or other substances. Where the ornamental character of the pavement forms a distinguishing feature, beautiful imitations of mosaic work may be executed with asphalte. The genuine asphalte possesses a degree of elasticity that renders it exceedingly durable; but artificial compounds in imitation of it generally require too much bitumen, and are injuriously affected by great changes of temperature. Some experiments have been made, but, as far as the writer is aware, with very indifferent success, on the formation of carriage-ways with large blocks of asphaltic composition containing a considerable quantity of gravel or broken stone.

Foot-pavements of flagstones require very little remark. The curb-stones should be very hard, and firmly set in cement on a bed of gravel. They usually rise about six inches above the surface of the carriage-way, which may be made to abut immediately upon them, without the intervention of a gutter. Where gutters are introduced, those of cast-iron are to be preferred. The flagstones, which should never be less than two inches and a half thick, are commonly bedded in mortar on a layer of gravel; but sometimes, when there are no cellars underneath, are laid dry. The appearance of many of the new streets of London is greatly improved by the use of flagstones of extraordinary dimensions, extending the whole width of the pavement; and a similar appearance at much less cost may be obtained by the use of asphalte. A slight degree of slope should be given to the pavement, to conduct water to the gutters, for which purpose a fall of one inch in ten feet is sufficient, while a steep inclination is objectionable from its danger in slippery weather.

Among the substitutes for common flagstones that have been recommended, may be mentioned slate, which appears to be very durable. Some pavements or floors of this material have been laid at the London Docks, where, among other advantages, it is found preferable to wood in point of cleanliness. Trackways of slate two inches thick are found strong enough to bear waggons or carts with four or five tons of goods; and some are laid of only half that thickness on an old wooden floor.

(A 'Treatise on Roads,' &c., by Sir Henry Parnell, of which a second edition was published in 1838, may be consulted with advantage by those desirous of obtaining further information on the theory and practice of road making. The works of Mc Adam, Edgeworth, and several others; and the various Parliamentary Reports relating to roads from the commencement of the present century, as well as those of the Holyhead-road Commissioners, also contain much valuable matter on this subject.)

It may be interesting to add a concise statement of the extent of turnpike and other roads in each of the counties of England and Wales, condensed from the Appendix to the 'Report of the Commissioners for inquiring into the State of the Roads in England and Wales,' 1840. Owing to the difficulty of obtaining complete returns from some districts, the statement can only be received as an approximation to accuracy; and this circumstance, combined with some difference in the kinds of road embraced in the returns of different years, must account for some discrepancies. The returns being given for two periods, with an interval of about twenty-five years, afford data for calculating the extension of the roads in each county; and the addition of a column, stating the area of the county in square miles, tends to show the proportion borne by the extent of the highways to that of the district. The columns giving the mileage for 1812-13-14 show the average of the returns for those years, a circumstance which must account for a want of agreement between the items and the totals. It must be observed also that paved streets are embraced with turnpikes in this statement, and not in that for 1839.

From the same document it appears that the average cost of maintaining the turnpike-roads, amounting to about 22,000 miles, has been, for the last five years, 989,54[illegible]l. per annum, or 45l. per mile per annum, including the estimated value of the statute duty performed on them. Of this sum about 36l. per mile has been expended on mere repairs and 2l. per mile on improvements. The money expended on management is about 129,2[illegible]l. annually, being nearly [illegible] per mile, and raising the total annual expense to nearly [illegible] per mile. The number of trusts is about 1116, averaging 19 miles, 5 furlongs, 28 poles, and 1 yard each; the number of toll gates and side bars about 7796, and of surveyors 13[illegible]. Of the parish highways extending rather more than 104,77[illegible] miles, the average annual cost of maintenance, by highway rates, is about 11l. 3s. per mile; and the number of parochial surveyors or waywardens about 20,000.

showing the number of miles of turnpike roads r highways in England and Wales:—

NTY.	Average of 1812-13-14.		1839.		Area in Square Miles.
	Paved Streets and Turnpikes.	Other Highways.	Turnpikes.	Other Highways.	
	Miles.	Miles.	Miles.	Miles.	
	163	667	215	715	463
	233	1,335	210	1,419	752
ham	211	1,287	196	1,445	738
lge	239	834	205	1,001	857
	506	1,602	531	2,357	1,052
l	291	3,530	340	3,734	1,330
iand	167	1,834	383	2,015	1,523
	637	1,696	607	1,978	1,028
	776	5,936	968	6,898	2,585
	308	1,696	475	1,761	1,006
	349	1,318	490	1,508	1,097
	320	2,813	282	3,113	1,533
ter	636	2,403	976	2,525	1,258
	497	3,044	621	3,199	1,625
l	456	1,195	505	1,374	863
l	195	1,336	230	1,475	630
gdon	139	357	125	378	372
	585	3,554	651	4,194	1,557
er	739	2,977	739	3,523	1,766
r	340	1,401	367	1,597	806
	492	3,933	495	4,620	2,611
ex	304	666	173	675	282
uth	265	772	215	1,114	496
	373	4,384	348	4,501	2,024
npton	354	1,547	413	1,638	1,016
nberland	458	2,322	399	2,203	1,871
ham	312	1,330	335	1,412	837
	303	1,133	325	1,177	756
	63	245	68	267	149
	713	2,252	761	1,876	1,343
t	817	3,165	930	3,724	1,645
	702	2,103	760	2,476	1,184
	322	2,962	281	3,235	1,515
	248	1,508	282	1,416	739
	558	2,333	678	2,368	1,466
k	431	1,813	463	1,814	897
reland	194	738	210	809	762
	589	2,263	628	2,336	1,367
er	443	1,409	391	1,426	723
. Riding	244	1,944	1,684	1,858	1,119
d Ainsty	—	—		142	86
ling	647	2,331		2,790	2,055
ding	946	4,054		4,674	2,576
England	17,500	86,100	18,955	94,760	50,380
ey	26	471	110	483	271
ck	169	727	185	850	754
n	141	687	222	836	675
then	356	1,158	507	1,440	974
on	116	552	160	668	544
a	178	1,061	109	1,068	633
	139	413	229	463	244
gan	292	1,174	591	1,277	792
eth	206	393	238	426	663
nery	356	961	299	824	839
ke	136	1,019	97	1,205	610
	76	410	260	478	426
f Wales	2,200	9,000	3,007	10,012	7,425
England les	19,700	95,100	21,962	104,772	57,805

ecting the roads of Scotland and Ireland there do ear to be published data for an equally minute state- The following account of the number of miles of e roads in each county in Scotland, given on the ty of a paper presented to a Committee of the House ls in 1833, shows their total length to be 3666 miles, divided by 190 the number of trusts, indicates the average length of each trust to be about three furlongs less than in England and Wales:—

County.	Miles.	County.	Miles.
Aberdeen	232	Lanark	374
Ayr	486	Linlithgow	117
Banff	123	Nairn	9
Berwick	126	Peebles	113
Clackmannan	71	Perth	225
Dumbarton	57	Renfrew	195
Dumfries	251	Roxburgh	193
Edinburgh	273	Selkirk	23
Elgin	26	Stirling	158
Forfar	131	Wigton	51
Haddington	120		
Kincardine	96	Total	3,666
Kirkcudbright	216		

ROANNE, a town in France, capital of an arrondissement in the department of Loire, 238 miles south-southeast from Paris by the road through Fontainebleau, Montargis, Nevers, and Moulins.

It is mentioned by Ptolemy, and in the Peutinger Table; its Latin name appears to have been variously written Rodumna and Roidumna; it belonged to the Segusiani. In the middle ages it gave name to a district, Roannais, but had sunk into insignificance at the beginning of the last century, from which commerce has since revived it.

The town stands in a tolerably fertile district on the left or west bank of the Loire, which here begins to be navigable up and down the stream; boats can descend from St. Rambert, more than 40 miles above Roanne, but they cannot ascend. The town has never been walled; the houses extend in every direction into the country, becoming less crowded as they diverge, and as they are not very lofty the place presents the aspect of a large village rather than of a town. The interior is well laid out, with wide and straight streets and well-built houses. Several of the genteel families of the surrounding district have fixed their residence at Roanne. There is a fine wooden bridge over the Loire, and a good quay along the river. The church is a very inferior building, but the college is handsome; and there are good inns, a fine hospital, a handsome theatre, and public baths.

The population, in 1831, was 8890 for the town, or 9260 for the whole commune; in 1836 it was 9910 for the commune. There are manufactures of woollen, cotton, and linen yarn or thread, woollen cloths, muslins, calicos, and other cottons, leather, glue, and earthenware; there are some dye-houses. The trade is considerable, being carried on not only by the Loire, but by the lateral canal to that river, which extends from Roanne to Digoin; it comprehends the manufactured goods of Lyon, which are sent here on their way to Paris, the coals of the coal field of St. Etienne, the wines and other produce of the neighbourhood and of other parts of the south of France, and the imports from the Levant. Some of the wines grown round the town are of fair quality, but the greater part are ordinary. Many boats are built here for carrying on this traffic.

The town has a college or high school, with a cabinet of natural philosophy attached to it, a public library, a subordinate court of justice, and some fiscal government offices.

The arrondissement has an area of 688 square miles, and comprehends 108 communes; it is divided into ten cantons or districts, each under a justice of the peace. The population, in 1831, was 121,817; in 1836 it was 124,871.

ROBBERY is theft aggravated by the circumstance of the property stolen being taken from the person, or whilst it is under the protection of the person, of the owner or other lawful possessor, either by violence or putting in fear. This offence appears to have been formerly confined to cases of actual violence to the person, but in later times it has been extended to constructive violence by putting in fear, and not only to cases where property has been taken or delivered under a threat of bodily violence to the party robbed or to some other person, but also where the fear has resulted from apprehension of violence to his habitation or to his property, or where it has been occasioned by threats of accusing the party of the commission of an infamous crime.

Robbery was formerly regarded not as an aggravation of the crime of theft, but as a distinct and substantial crime. Latterly however robbery has been treated as an aggravation of theft, and it has been held that if, upon the trial of an indictment for larceny, it appear that the taking amounted to a robbery, the party may nevertheless be convicted of the larceny charged.

The stealing is said to be by violence when it is effected by doing any injury, however slight, to the person of the party robbed, or when the act of taking is accompanied by any degree of force for the purpose of overcoming resistance. A snatching or taking of property suddenly or unawares from the person without some actual injury to the person does not amount to robbery. If violence be used, it is sufficient to constitute robbery, although resorted to under the colour of executing legal process or of the exercise of some other lawful authority. It is not essential to the offence of robbery that the violence should have been at first used for the purpose of obtaining the property, provided the violence be unlawful and the property is yielded up, or permitted to be taken, in order to prevent further violence.

Stealing is considered to be effected by threat of violence to the person, when possession of the thing stolen is obtained by any threat, menace, or other act calculated to excite fear or apprehension of violence, present or future, to the person of the party threatened or of any other party in whose welfare the party to whom the threat is addressed may feel interested. It is immaterial whether the threat, &c. be direct or indirect, or whether conveyed by words, gestures, or signs, or whether made under pretence of lawful claim or of acting under legal process or other lawful authority, or of asking charity, or of making a purchase, or under any other pretence. The existence of actual fear in the mind of the party robbed is not material, provided the act of stealing be accompanied by such threats or other acts as are calculated to create the expectation that force will be used in case of resistance. Where no actual violence is employed, and the threats, &c. used do not create any apprehension of violence or expectation that force will be resorted to in case of resistance, or if such apprehension or expectation has ceased to exist at the time when the property is taken, the offence of robbery is not committed. If property be taken by violence or by threats, &c., it is robbery, although the owner may have voluntarily exposed himself to the attack for the purpose of apprehending the offender. (*Fourth Report of Commissioners on Criminal Law.*)

At common law, robbery was a felony punishable by death, without regard to the quantity or value of the property stolen. The offender however was entitled to benefit of clergy [Benefit of Clergy], until this advantage was taken away in cases of robbery, under different circumstances of aggravation, by several statutes.

The offender was liable to be punished at the suit of the king after a trial upon an indictment, and, in certain cases, when taken in the very act, upon a trial without indictment. The party robbed also was entitled to bring his criminal action or appeal [Appeal] against the robber, for the purpose as well of punishing the offender as of obtaining restitution of the property stolen. If the appellee waged battle the combat took place between the appellor and appellee in person, as no champions were allowed in appeals of robbery. Though the appellor was always bound to offer to prove the offence charged by his body, the appellee was not obliged to accept that mode of trial. Thus in the Pleas of gaol delivery at Shrewsbury, in October, 1224, we find this entry, 'Robert de Haddeleg appeals Roger de Hybernia, for that whereas on the day of St. James the apostle he was coming through Trumpeleg between Bruges (Bridgnorth) and Worcester, came the said Roger and took him and bound him, and wickedly and in robbery, and against the king's peace, took from him 15½*d.* of bread. And Roger denies (defendit) the felony and robbery, and says that he did nothing against the king's peace, and he puts himself upon the township of Shrewsbury, where he resided two years, and upon the town of Bruges, and upon lawful men near Trumpeleg, for good and evil. And 16 men of Shrewsbury and 6 of Bruges with the men of the neighbourhood say upon their oath that they do not mistrust him of (non male credunt ei) of that robbery. Therefore let him be delivered; and let him go out of the lands of the lord the king unless he can find pledges. And he could not find them. Therefore let him go out. And he chose the port of Dover.' (*Placitorum Abbreviatio*, 104, b.)

The party robbed may without any formality retake his goods wherever he can find them, unless they have been waived or thrown away by the robber during his flight, or seized by the officer of the king or of the lord of the franchise, or sold in open market. [Market, p. 423.] But after such waiver, seizure, or sale, the owner cannot retal
of his own authority. Where there has been no ir
neglect to prosecute, the party will in general be en
his writ of restitution. This at common law c
obtained only upon the successful prosecution of a
appeal. But by 21 Hen. VIII., c. 11, the court befor
a party is convicted of robbery or of larceny upon ar
ment, is authorised to award writs of restitution
money, goods, or chattels stolen, in like manner as
the felon or felons were attainted at the suit of the par
appeal. Restitution of stolen goods, whether ta
robbery or by larceny, is now regulated by 7th and
IV., cap. 29, sect. 57. [Restitution.] The party
cannot sue for the goods stolen or their value aga
robber or any person who may have acquired th
stolen from the robber, unless he has done all in h
to bring the offender to justice.

By the statute of Winton, passed in 1284, the inh
of hundreds in which robberies take place are made
able for the value of the property stolen, if they
taken the offenders within a certain time after t

To entitle the party to this remedy he must, in h
against the hundred, show that he was robbed in
time or while there was sufficient light to distinguish
countenance, that he was robbed openly, as on the l
or in a lane or wood, or some other open place, and
dwelling-house, which a man is expected to defen
own peril, that he was robbed in the hundred m
the declaration, but whether in the vill or parish
or in some other vill or parish, is not material,
robbed on a Sunday, that he was not travelling at t
the statute passed in the reign of Char. II. for th
observance of that day having expressly enacted
any person who shall travel on the Lord's day
then robbed, the hundred shall not be answerable
robbery so committed.' The plaintiff is also bound
that he has given certain notices, and has submitted
to examination before a justice of the peace, as req
different statutes. (2 Saunders's *Reports*, 374: 4 Ma
Ryl. 130: 9 Barn. and Cress., 134.) And by 22
c 24, the hundred is not to be liable beyond 200*l*
the person or persons robbed shall at the time of the
be together in company, and be in number two at t
to attest the truth of the robbery.

Under 7 Wm. IV. and 1 Vict., c. 87, s. 5-10, r
punishable by transportation for life or for any
years not less than seven, or by imprisonment for a
not exceeding three years, and for any period of
confinement during such imprisonment not exceed
month at a time, or three months in the space of o
at the discretion of the court or judge, by or befor
the offender may be tried; but by sect. 4, where
bery is effected by threatening to accuse the par
infamous crime, the period of transportation is f
for a term not less than 15 years. By the same
sect. 6, assaulting with intent to rob, and, by sec
manding any property of any person by menace
force, is made felony punishable by imprisonment
ceeding three years.

By the same statute, sect. 2, the punishment of
imposed upon the offence of robbing any person, at
time of or immediately after such robbery stabbi
ting, or wounding any person.

Upon an indictment for robbery, as well as for a
felony which includes an assault upon the person,
are authorised by 7 Wm. IV. and 1 Vict., c. 85, se
acquit of the felony, and to find a verdict of guilty of
against the party indicted, if the evidence will warra
finding; for which assault the party may be sente
imprisonment for any term not exceeding three yea

Robbery, in the Roman law, was called Rapina,
remedy of the injured person was the actio vi b
raptorum against the robber, which was given by th
Robbery was, in fact, a species of Furtum: for the
tion of furtum was, 'a fraudulent carrying off (co
tio) of a moveable thing against the owner's consen
word 'fraudulent' comprehended the notion of a per
rying off the thing for the purpose of making it
Rapina only differed from Furtum in being eff
force.

Furtum was committed in various ways, besides b
another person's property. A debtor committed fu
he fraudulently carried off a thing which he had

to his creditor. It was furtum to use a thing that had been lent, for a different purpose from that for which it had been lent. Furtum was either manifestum or nec manifestum. It was furtum manifestum beyond all doubt when the thief was caught in the act; but there was a difference of opinion as to whether it was furtum manifestum or nec manifestum in a variety of cases. According to some writers, it was furtum manifestum if the thief was taken with the thing before he had reached the place to which he intended to carry it. Furtum which was not manifestum was nec manifestum. The Twelve Tables made the punishment of furtum manifestum a capital offence, that is, an offence the penalty for which affected a person's caput or status. The edict changed this into an actio quadrupli. The remedy in the case of furtum nec manifestum, which the Twelve Tables gave, was an actio dupli, which the edict retained. All persons could have the actio furti who had an interest in the preservation of the stolen thing; consequently others besides the owner might bring the action, a bailee for instance: and sometimes the owner could not bring it, as in the case of bailment, provided the bailee was a responsible person. If he was a responsible person, he was bound to make good the loss to the owner, and consequently could bring the action, and the owner could not. Condemnation in an actio furti was followed by infamia.

The owner of the thing might also bring his action for the recovery of the thing itself or its value.

The law of the Twelve Tables permitted a person to kill a thief who was detected in the act of theft in the night; and a thief might be killed in the day-time, if he defended himself with any weapon (telum). But the severity of the old civil law was gradually mitigated by the edict, and the offence of theft was, as already observed, only punishable by an action of furtum, and the consequent pecuniary penalties.

The actio vi bonorum raptorum originated in the civil wars of the later republican period, and its object was not so much to repress robbery as all acts of violence committed by bands of armed men. Accordingly its terms comprehended those who carried off any thing (quid rapuerint), or committed any damage to property (damnum) in armed bodies (armati coactique). It appears that under the empire, when order was established, the provision against armed men was not wanted, and the word *armati* seems to have been dropped from the edict. Still the edict was directed against *assemblages* of men, and it became of comparatively little use in the peaceful times of the empire. Accordingly the jurists were led to make the discovery that the edict applied to individuals as well as to bodies of men, and thus ultimately an action might be maintained under the edict against a single person who committed damnum or rapina. Finally, damnum, against which the edict was originally mainly directed, disappeared from the edict, as we observe in the Institutes and the Code, and the action was reduced simply to an actio vi bonorum raptorum.

The Roman law of furtum is stated in Gaius, iii. 183-209. The following references will be useful: *Dig.*, 47, tit. 2: *Inst.*, 4, tit. 1; Savigny, *Zeitschrift*, &c., vol. v., *Ueber Cicero pro Tullio*, &c.; Dirksen, *Uebersicht der Zwölf Tafeln Fragmente*.

ROBERT I. of Normandie. [NORMANDIE.]

ROBERT II. of Normandie. [NORMANDIE.]

ROBERT, king of France, was elected king on the death of his brother Eudes, by that party of the French who rejected the claims of Charles le Simple. [CHARLES III.] He was recognised as king in an assembly of his partizans, held at Soissons (A.D. 922), and consecrated in the church of St. Remi, at Reims, by the archbishop of Sens. He fell in battle against his competitor Charles le Simple, near Soissons, 15th of June, 923, having reigned scarcely a year. He was grandfather to Hugues Capet, founder of the third or Capetian race of French kings.

ROBERT, king of France, surnamed *le Sage* (the wise), and *le Dévot* (the devout), was son of Hugues Capet, whom he succeeded on the throne, A.D. 996. He was born about A.D. 970, and had been twice crowned in the lifetime of his father; at Orléans, A.D. 988, and at Reims, A.D. 991. The character of Robert was devoid of shining qualities, but he was a prince of upright and peaceable disposition. Early in his reign France was afflicted by a scarcity of four years continuance, arising from the failure of the harvests, and the scarcity was followed by a pestilence, which again appeared 010, and a third time in 1030-33. These calamities are have reduced the population of France a third.

Robert was early embroiled with the church; he had married (A.D. 995) Berthe or Bertha, widow of Eudes, count of Blois, but there were some difficulties as to the lawfulness of the marriage, for which Pope Gregory V. refused a dispensation, and declared the marriage void. The king refused obedience, in consequence of which he was excommunicated; and it is said that under this terrible sentence his palace was deserted by all except two menials, who after every meal purified by fire the utensils employed at the royal table. Robert at length yielded; he put away Bertha (A.D. 998), and married Constance, daughter of the count of Toulouse, an imperious and vindictive woman, but one of the greatest beauties of her time. Robert and Constance may be compared in point of character to Henry VI. of England and his consort Margaret of Anjou.

In A.D. 1002, Robert engaged in a war to secure the succession of the duchy of Bourgogne, of which he was lawful heir; and, being supported by Richard, duke of Normandie, succeeded, after a struggle of thirteen years (A.D. 1002-15), in gaining possession of it. He bestowed it on his son Henry. In A.D. 1006 he marched to the assistance of the count of Flanders, one of his great vassals, attacked by the emperor Henry II., who was obliged to retire. Peace was concluded next year between the two princes.

Robert possessed a taste for music, and, prompted by this, as well as his devotional temper, frequently led the choir of St. Denis, and composed hymns for monastic use. He is charged with lavishing his treasure upon mendicants, conniving at thefts from his own person, and truckling to the fierce and cruel temper of his queen, who presumed so far on his tameness as to procure his favourite, Hugues de Beauvais, to be murdered in his presence.

Robert visited all the shrines in France, and went to Rome (A.D. 1019) to visit the tombs of the Apostles; perhaps also, as some have supposed, with the view of inducing the pope to annul his marriage with Constance, and to sanction his reunion with his first wife, Bertha.

He persecuted the Jews, and procured, in a council held, A.D. 1022, at Orléans, the condemnation of some priests charged with heresy, which was described as 'Gnosticism,' or 'Manicheism,' but the true character of which it is not easy now to ascertain. They were brought to the stake at Orléans, and Constance, with characteristic ferocity, struck out the eye of one of the sufferers, formerly her own confessor, as he passed her in the way to execution.

However Robert may have been led astray by the superstitious and persecuting spirit of the age, his moderation and love of peace were exemplary. He mediated between the duke of Normandie and the count of Chartres, who were engaged in hostilities, and obtained the confidence of the emperor Henry II., who visited him in his camp (A.D. 1023). On the death of this emperor, he refused, both for himself and his son, the crown of Italy, which was offered him by the malcontents of that country.

His eldest son, Hugues, to whom he had given the title of king (A.D. 1022), provoked by the cruelty of his mother, broke out into rebellion, but being taken and delivered up to the king, was pardoned. He died however soon after (A.D. 1026). Henry, his next son, was then associated with him in the royal title, in spite of the endeavours of Constance, who espoused the interest of Robert, the third son. Robert took up arms against his father, but his rebellion was suppressed. Shortly after quiet was restored King Robert died, at Melun (A.D. 1031), sincerely regretted, as it appears, by his subjects. 'While Robert was king,' said they, 'while he governed us, we have lived in security and have feared nobody.' He was buried at St. Denis.

ROBERT I., king of Scotland. [BRUCE, ROBERT; BANNOCKBURN.]

ROBERT II., king of Scotland, the first of the House of Stewart who reigned in that country, was born 2nd of March, 1316, and was the only child of Walter, the Stewart of Scotland, and his wife Marjory, daughter of King Robert Bruce, to whom he had been married the preceding year. All that is known of the House of Stewart previous to this date is, that a Walter, son of Alan, was Stewart or *Dapifer* of Scotland in the reigns of David I. and Malcolm IV.; that he was succeeded in that high office by his son Alan; this Alan by his son Walter; Walter by his son Alexander, who was one of the regents appointed during the minority of Alexander III., and who, in 1263, commanded the Scottish army at the battle of Largs; Alexander, by his son James, who was regent after the death of Alexander III., and died in 1309 at the age of sixty-six: and he, by his son Walter, the father of Robert II. This Walter was one of the commanders of the Scottish army at the battle of Bannockburn; and early in the following year, 1315, Bruce gave him in marriage his daughter and then only child Marjory, upon whom, provided she should marry with the consent of her father, or, after his death, with the consent of the majority of the community (or states) of the kingdom, the crown had been settled, failing the heirs male of her father and of his brother Edward, in a parliament held at Ayr on the 26th of April in that same year. Robert was the only issue of this marriage. Lord Hailes (*Annals of Scotland*, vol. ii., Appendix i.) has sufficiently refuted the tradition that Marjory was killed by being thrown from her horse when big with child, and that Robert was brought into the world by the Cæsarean operation: but it appears that she died either in giving birth to the infant or soon after her delivery. Her husband died 9th April, 1326, after having had another son, Sir John Stewart of Railstone, by a second marriage with a sister of Graham of Abercorn.

Bruce was succeeded by his son David II., born of a second marriage, 5th March, 1324; and his unfortunate reign—marked by a long minority and a succession of regencies, during which the kingdom was overrun by Edward Balliol and his ally Edward III., and David was obliged to make his escape to France, and after that by the defeat of Neville's Cross, when David was taken prisoner by the English—fills up the interval from 1329 to 1371. Robert, the Stewart, acted a principal part throughout this reign, and was as much distinguished by his personal merits and conduct as by his high rank. While yet only a youth of sixteen, he commanded the second division of the Scottish army at the decisive battle of Halidon, fought, and lost by the Scots, 19th July, 1333; and after that fatal day he was one of the first to uplift again the standard of the national independence. In 1334, he and the earl of Moray assumed the regency of the kingdom, and, although not formally invested with the government by any assembly of the states, were recognised by the people as entitled, in the infancy and exile of the king, to wield all the authority of the crown. Fordun's description of the Stewart at this time, as Lord Hailes translates the passage, is as follows:—'He was a comely youth, tall and robust, modest, liberal, gay, and courteous; and, for the innate sweetness of his disposition, generally beloved by true-hearted Scotsmen.' In a subsequent passage however he hints that his conduct as yet was not always regulated by absolute wisdom,—'qui tunc non magna regebatur sapientia.' On the earl of Moray being taken prisoner by the English the following year, the Stewart, in concert with the earl of Athol, concluded with Edward III., on the 18th of August, 1335, the treaty of Perth, which was in fact a submission, though upon honourable conditions, to the English king. After this we hear no more of the Stewart till 1338, when, upon the death of the regent, Sir Andrew Moray, we find him again appointed to that supreme office. His resumption of the government was soon followed by the expulsion of the English from all their strongholds to the north of the Forth, and his regency was terminated by the return of the king, on the 4th of May, 1341. In 1346, after the capture of the king at the battle of Neville's Cross, where he commanded the left wing of the Scottish army, in conjunction with the earl of March, the Stewart was again elected regent, or 'locum tenens serenissimi principis David,' &c., and he held this post till the release of David, in 1357, governing the country, it is affirmed, with remarkable prudence and ability in the difficult circumstances in which he was placed. In 1359 the earldom of Strathearn was conferred upon him by the king. When David, in 1363, astonished the nation by proposing to a parliament, held at Scone, that in the event of his dying without issue, Lionel, duke of Clarence, son of Edward III., should be chosen king, the Stewart, whose interests, as well as his patriotic prejudices, this project so nearly touched, was one of the foremost of those who adopted instant measures to defeat it. He entered into an association with the earls of March and Douglas, and with his own sons, and he even appears to have taken up arms with the avowed determination of driving the king from the throne, if he persisted in his purpose. David however found means, without making any formal concession, to put down this threatened resistance: and, upon a general amnesty being granted, the Stewart, on the 14th of May, 1363, renewed his oath of fealty, and entered into a bond to abstain from all such confederacies in time coming, on pain of forfeiting for ever all right and title to the crown, as well as to his private inheritances. Soon after this David, who had lost his first wife, Joanna, a daughter of Edward II., in the preceding year, contracted a second marriage with Margaret Logan, but she also bore him no children; indeed he had separated from her some time before his death, which took place on the 22nd of February, 1371.

Upon this event the states of the kingdom immediately assembled at Linlithgow; and after a slight opposition on the part of the earl of Douglas, who conceived that he had himself a claim to the vacant dignity, as representing the families both of Comyn and Balliol, the Stewart was unanimously declared king, by the title of Robert II. He was crowned at Scone, on the 26th of March, and next day, according to custom, received the homage of the bishops and barons, seated on the moot-hill there.

Robert II., when he thus succeeded to the throne, was somewhat peculiarly situated in regard to his domestic relations; and the point demands particular notice, inasmuch as a controversy has thence arisen on the question of the legitimacy of the Stuarts, which continued to be agitated, both among antiquaries and political writers, down to the middle of the last century. His first wife was Elizabeth, daughter of Sir Adam Mure, of Rowallan; but the family he had by her, consisting of four sons and six daughters, had all been born before their marriage. In ordinary circumstances a subsequent marriage might probably, in Scotland, even at this early date, have legitimatized these children, at least in the eye of the church, although their right of civil succession, and especially of succession to the crown, might not have been in that way so certainly established; but there was a very awkward speciality in the present case. Robert and Elizabeth Mure had been living not only in concubinage, but in what the church considered incest, for they were related, it seems, in the fourth degree. Nay, to make matters worse, the Stewart, before his acquaintance with Elizabeth Mure, had been connected in the same way with Isabella Boutelier, who was related to her in the third degree; and this, according to the canonical doctrine, placed him in a relationship by affinity of the same, that is, of the third degree, to Elizabeth Mure. His marriage in any circumstances therefore with that lady, would have demanded a papal dispensation; but it was far from being universally admitted that even the authority of the pope could establish the legitimacy of children born in a connection which thus openly violated and set at defiance what was believed to be the divine law. It is obvious that a dispensation to persons within the prohibited degrees to marry is an exercise of prerogative on the part of the head of the church much inferior to the legitimization of the children already produced from an incestuous connection. So strongly in the present case does this appear to have been felt, that the pope's dispensation actually proceeds upon the monstrous supposition that Robert and his wife Elizabeth Mure, long as they had lived together, had been all the while ignorant of their relationship, and on that manifestly fictitious ground alone does his holiness profess to sanction their marriage, and to pronounce the legitimacy of their children. But the dispensation by no means satisfied the popular feeling of the time; and there is reason to believe that the supposed defect in the right of the reigning family materially contributed in exciting and sustaining some of the most formidable of the insurrectionary attempts which convulsed the Scottish kingdom in the course of the succeeding century. Robert, after the death of Elizabeth Mure, had married Euphemia Ross, a daughter of the earl of Ross, by whom he had two more sons and four daughters, also all born when he came to the crown. Thus circumstanced, in 1371, immediately after his accession, he got the states to pass an act recognising John, earl of Carrick, his eldest son by Elizabeth Mure, as his successor; and, still better to secure the rights of his first family, he procured, in 1373, another act expressly entailing the crown upon his heirs male of both families, and after them upon *his heirs whatsoever*. It is obvious that, whatever might be the force of this parliamentary settlement in securing the crown to Robert's heirs male by the sons of Elizabeth Mure, who were named in it, as soon as such heirs failed, the question would legally arise, who were his heirs whatsoever, or general: and if the papal legitimization of the first family should be set aside, then his heir whatsoever would have to be looked for among the descendants of one of his sons or daughters by Euphess. Now, it so happened that such was the case on ath of James V., leaving only a daughter, Mary, in At this moment the heir-general of Robert II., on position of his family by Elizabeth Mure being ille- e, was the earl of Menteith, the lineal descendant of ia Ross's eldest son, David earl of Strathearn; and able fact that in the early part of the seven- h century the pretensions put forward on this ground then earl of Menteith, who was justice-general, and nt of the Scottish privy council, occasioned no small ess to Charles I., and brought down ruin upon lf. For the latest and also the most learned and discussion of this question, the reader is referred 'racts, Legal and Historical, with other Antiquarian chiefly relative to Scotland,' by John Riddell, Esq., , 8vo., Edinburgh, 1835; dissertation iii., entitled s upon the Law of Legitimation per Subsequens imonium, the Nature of our Antient Canons, and the tion of the Legitimacy of the Stewarts.' pp. 155-211. Riddell, we may add, states that the undoubted representive of the earls of Menteith, and of the eldest son obert II. by his second wife, is the present Mr. ay Allardyce of Ury, the head, we suppose, of the famous Quaker family: a singular enough destination truest hereditary right to the sceptre of Robert Bruce.

ruce for fourteen years had been concluded with Eng- two years before the death of the late king; and as as Edward III. lived, the two countries remained at . In 1377 however, immediately after the accession of d II., a war arose out of what appears to have been at private quarrel between the English garrison at Rox- and the earl of March. Hostilities continued, with a hort interruptions, till November, 1380, when a truce elve months was arranged, which was afterwards ex- d to the summer of 1383. In 1384 however, the war out again with more violence than ever, the Scots now assisted by a body of French auxiliaries, who in May, 1385, under the command of Jean de e, admiral of France. In the summer of that year, the young English king led his army in person into orth, laying waste the country and burning every town illage he came to in his progress [RICHARD II.], a force ots and French, entering England by the western es, ravaged Cumberland and laid siege to Carlisle, but when the enemy returned southwards, without cted an entry into that town. Soon after this, rench, who had found the Scots and everything tland very little to their mind, and had also made elves cordially disliked by the people they came to or more truly to make use of for their own purposes, ed home, though not till they had agreed to pay the se of their maintenance, and had been forced to leave leader Vienne as a hostage for the performance of engagement—a conclusion of the business which has much obloquy upon the Scots from those who have idered the real object of the French in this expe- which was certainly much more to annoy the Eng- n to benefit the Scots. A truce for another year the departure of the foreigners; but the fighting ed in 1387. That year the town of Carlingford in was plundered and burned by a force under the nd of William Douglas, recently created Lord Niths- married to one of the king's daughters; and in famous battle of Otterbourne, or Chevy Chace, d from the Percies, though at the expense of his by the earl of Douglas. [RICHARD II.] By this wever the reins of government had nearly dropped the hands of king Robert. Froissart tells us that, unfitted by his years and broken health for going out ore to war, he was no longer consulted in public by the nobles, by whom and also by the nation in the king's second surviving son, Robert, earl of Fife ards duke of Albany), was now looked upon as the r of the country. In 1389 indeed, the earl of Fife y recognised as governor of the kingdom by an of the estates held at Edinburgh. After this the ears to have lived almost entirely on his ances- in Ayrshire, where indeed he had been much in of secluding himself for some years previous. It y now, in his old age, that his originally en- onal appearance was deformed by the breaking inflammation in his eyelids, from which he de- opular designation of *Blear-eye*. The fable about his birth makes him to have been wounded in one of his eyes by the surgeon who cut him from his mother's side.

The war with England was prosecuted by the regent for some months with considerable vigour; but before any action of importance had taken place, hostilities were terminated for the present, in June, 1389, by a truce concluded between France and England for three years, in which the allies of both powers were comprehended. The country was therefore at peace when Robert II. died, after a short illness, at his castle of Dundonald in Kyle, on the 19th of April, 1390.

Besides his six sons and ten daughters by his two wives, this first of the royal Stewarts had a numerous illegitimate progeny by various other women. His six lawfully begotten daughters married into the families of the earl of March, Lyon of Glamis (now earls of Strathmore), Hay of Errol (now earls of Errol and earls of Kinnoul), Macdonald of the Isles, Douglas of Nithsdale, Lindsay of Glenesk, the earl of Douglas, Keith earl Marischal, Logan, and Swinton. From six of his illegitimate sons the Stuarts of Bute, Cairney, and other families of that name deduce their descent. Robert II. was succeeded by his eldest son Robert III.

ROBERT III., king of Scotland, the eldest son of Robert II., relinquished his original name of John on succeeding to the crown, on account, it is said, of a popular superstition of his countrymen which regarded that name as unlucky or ominous. But if so, it is rather strange that the heir apparent should have ever been so christened. He was known throughout the preceding reign by the title of the earl of Carrick, a dignity which had been bestowed upon him by King David II. Before acquiring that dignity he appears to have been designated the lord of Kyle. He was probably born before the year 1340, so that he was past fifty when he came to the throne, on the death of his father, in 1390. It is known that he had been married at least since the year 1357, to Annabella Drummond, a daughter of Sir John Drummond of Stobhall. He had been lamed in his youth by a kick from a horse; and this accident, combined with his mild and pacific disposition, of which perhaps it was in part the cause, made him be regarded, both before he became king and afterwards, with feelings of something very like contempt by the generality of his countrymen.

The coronation of Robert III. took place at Scone on the 14th of August, 1390. No events of any note mark the first eight or nine years of the reign, during the whole of which the king's brother, the Earl of Fife (who was in 1398 created Duke of Albany), continued to retain the management of public affairs, and even, according to some authorities, the title of governor or regent. [ROBERT II.] The truce which had been made with England in 1389, was kept up by various continuations throughout the reign of the English king Richard II. But war broke out again on the accession of Henry IV., in 1399; France, as usual, exciting the Scots to harass England by predatory expeditions across the borders, which could only end in drawing down signal vengeance upon themselves. In August of the following year, accordingly, Henry entered Scotland at the head of a powerful army, and advanced as far as Edinburgh, which was however successfully defended by the king's eldest son, the duke of Rothsay; and Henry returned home after having received the submission of various towns and villages through which he passed, but without having given the country cause to remember his visit further than by this mere demonstration of his power. In the following year however Henry Percy (Hotspur) made a more destructive inroad as far as to Preston in East Lothian. On this occasion Percy was joined by the Scottish Earl of March, who had recently thrown up his allegiance and gone over to the English king, in a fury of revenge provoked by the ill usage he held himself to have received from the Duke of Rothsay, who, after having been affianced to his daughter, had actually married a daughter of the Earl of Douglas. The following year, 1402, is memorable for the tragical catastrophe of Rothsay, who, at the instigation of his uncle Albany, the friend of March, was, on the pretence of restraining or punishing his dissoluteness, seized under an order professing to be signed by his father, and confined first in the castle of St. Andrews, and then in that of Falkland, where he is believed to have been left to perish of famine. He was only in his twenty-fourth year when he thus fell a victim, in all probability, to the dark ambition of his kinsman. A few weeks after the prince's death, a pardon or remission in very ample terms for any concern he might have had in this affair was granted by the king to Albany; and has been published by Lord Hailes in chapter vi. of his 'Remarks on the History of Scotland,' Edinburgh, 1772. In this remarkable paper it is stated that Albany admitted the capture and arrest of the prince, but justified what he had done by reasons which the king did not then hold it expedient to publish to the world. No express denial of the fact of the murder is ventured upon; it is merely recited that the prince departed this life in his prison at Falkland, through divine providence, and not otherwise—'ubi ab hac luce, divina providentia, et non aliter, migrasse dignoscitur.' 'The reader,' observes Hailes, 'will determine as to the import of this phrase. If by it a natural death was intended, the circumlocution seems strange and affected.' It ought to be added that Archibald, the young earl of Douglas, the brother-in-law of Rothsay, who had acted throughout the affair along with Albany, was equally charged by the voice of common fame with the murder, and was included in the same acquittal or indemnity. It is conjectured that Rothsay had made the proud baron his enemy by his infidelity to or neglect of his sister.

This same year, on the 22nd of June, the Scots, commanded by Patrick Hepburn of Hales, were defeated with great loss, at West Nisbet in the Merse, by the English under the conduct of the Earl of Northumberland and the renegade Earl of March; and on the 14th of September following the Earl of Douglas received a still more disastrous discomfiture from the Lord Henry Percy at Homilton Hill in Northumberland. When immediately after this the Percies rose in rebellion, the Duke of Albany put himself at the head of a numerous force and set out for the south with the design of taking advantage of the embarrassing circumstances of the English king; but the news of Henry's victory at Shrewsbury turned him back before he had got across the border. In the course of the two following years several attempts were made to arrange a peace, or long truce, between the two countries, but without success. Hostilities however had been for a considerable time suspended by these negociations, when King Robert, now awakened to a strong suspicion of the designs of his brother Albany, resolved to send his only surviving son James, styled earl of Carrick, to France for safety; and the prince, then in his eleventh year, was on the 30th of March, 1405, captured at sea by an English vessel on his way to that country. [James I.] His detention by King Henry is believed to have broken the heart of his father, who expired at the castle of Rothsay in Bute, on the 4th of April, 1406. He was succeeded by his son, James I.

ROBERT, King of Naples. [Sicilies, Two.]

ROBERT GUISCARD. [Naples.]

ROBERT OF GLOUCESTER is supposed to have been a monk in the abbey there, but of his personal history nothing whatever is certainly known. It may however be collected, from a passage in his work, that he was living at the time of the battle of Evesham, and he seems to have lived not very long after that event, as the history of English affairs which he has left us ends before the beginning of the reign of Edward I.

This history is the only writing that is attributed to him, and is, in more points of view than one, among the most curious and valuable writings of the middle period that have come down to us. It is a history of English affairs from the beginning, including the pictures of Geoffrey of Monmouth, and ending with the death of Sir Henry of Almaine, valuable in the latter portions for the facts which it contains, whether peculiar to itself or correlative with the statements of other chroniclers; and abounding throughout with anecdotes or minor historical circumstances peculiar to itself, and sometimes of an interesting if not useful nature.

It is in the vernacular language of the time; that is, in the language in which we find the Anglo-Saxon passing into the language of Chaucer and Wickliffe, this work and the similar work of Robert of Bonne being the best specimens which remain of the language. It is in verse, and may stand therefore as a specimen of the poetry of the time. It consists of more than ten thousand lines.

The work was popular in the middle ages, as appears by the number of manuscripts that still exist of it. The principal are the Bodleian, the Cottonian, and the Harleian. There is one in the library of the Herald's College. There are slight variations in the text of each, and that at the Herald's College appears to have had the language modernised
early copyist. Little regard was paid to Robert by
sons who, in the reign of Elizabeth, collected and
the manuscripts of the best English chroniclers,
Camden, in his 'Britannia,' and still more frequentl
'Remains,' has citations from him. Weever, in
tient Funeral Monuments,' has many quotations fro
and Selden quotes him on several occasions. The
given at large to the public in 1724, by Hearne, in
tavo volumes, of which there was a reprint in 1810.

ROBERT (GROSSETESTE), bishop of Lincol
eminent scholar and prelate in the early years of
of Henry III. The exact time and the place of
and the family from which he sprung, are alike
obscurity of those remote times; but it may be
from the dates ascertained of other events in his life,
was born about the year 1175. He studied at Oxf
like most of the very eminent of the English theolo
that period, he went from thence to Paris. He there
himself to the study of the Hebrew and Greek lang
both of which he attained the mastery, and distinguis
self by his attainments in the whole course of study
to the students in that learned university. He re
England skilled not only in the five languages,
French, Latin, Greek, and Hebrew, but skilled als
and philosophy, divinity and the Scriptures, and po
also a knowledge of medicine and ecclesiastical law.
no exaggeration in this, for many of his writings
scended to our time, which prove the statement, to
derable extent at least. We may refer particularly
numerous treatises in natural philosophy, which it
be expected of us to describe individually, as the titl
little more respecting them, fill four quarto pages
Pegge's Life of him (4to., 1793, p. 278-283).

When he returned to England, he settled at
where he delivered lectures. There is extant a
Giraldus Cambrensis to the bishop of Hereford,
mending Grosseteste to his notice, but the bishop
soon after, that little advantage can have arisen
He found however a very efficient patron in another
namely, Hugh de Wells, bishop of Lincoln, who, a
mark of his favour, gave him the prebend of Clifto
church of Lincoln. He had also several archdeaconri
Chester, Northampton, and Leicester, and in 1235
ceeded his patron in the bishopric of Lincoln, then a
of immense extent. This dignity he held for eightee
dying in 1253.

Bishop Grosseteste made the power which his
ledged and extraordinary attainments gave him, sub
to the accomplishment of important public objects.
a great reformer of his diocese, a vigilant superinte
his clergy, a maintainer of order among them an
ecclesiastical affairs. If one of the great earls o
offended, he did not scruple to assert at once the
possessed to correct the abuse, of which an instance is
in his calling the earl of Warren to account for irreg
ligious solemnizations. He stood up against the ki
he would interfere with the rights of the clergy, who
in those times the strongest part of the opposition to
of kings, who, if there had been no clergy, woul
been almost absolute; and he opposed with equal
and success the pope, when he would support antient
or introduce new to the injury of the English c
people. In short he can hardly be regarded in a
light than one of the great benefactors to the English
and nation in the discharge of his political duties as a
and he was one of the lights of his age by the lecture
he delivered and the books which he wrote.

His attainments in natural science gained for
reputation of being a magician and a sorcerer, an
fables gathered about his name.

Many of his writings have been printed, and m
main in manuscript, and are found in most of th
libraries of Europe. An ample list of these is give
Pegge's work before referred to; in which work
found critical inquiries into all the particulars of
and a great mass of curious information respecting
of ecclesiastical affairs in England in the first hal
thirteenth century.

ROBERT, LÉOPOLD, a modern French artist
and deserved celebrity, was born at Chaux-le-Fond
canton of Neuchâtel, in 1797. His father inte
bring him up to his own trade, which was that of

maker, but yielding to the boy's decided inclination for the arts, sent him to Paris to study engraving under Girardet, an artist known by his print of the Transfiguration, after Raphael. His progress was so rapid, that in 1812 he obtained the second grand prize at the Ecole des Beaux-Arts, after which he began to study painting in the school of David. He then proceeded to Italy, and, renouncing engraving altogether, devoted himself entirely to his pencil, leading a life of solitude and privation, without either patrons or friends. But though his enthusiasm for his art was great, it was marked rather by severe application than by that promptitude which is generally supposed to characterise genius. Though he did much, he executed few productions, being not only remarkably slow with his pencil, but in the habit of destroying or laying aside picture after picture until he could satisfy himself with the subject that he had commenced. He is said to have thus spent between three and four years on a single picture; for instance, that of the 'Reapers,' which excited so much admiration when first exhibited at Paris in 1831. In that piece, in the 'Neapolitan Improvisatore,' the 'Madonna dell' Arco,' and similar subjects, he succeeded in delineating Italian life and character in the happiest manner, with perfect fidelity, but also with a touching refinement and grace, at the same time without any of that affectation which the French schools are apt to mistake for refinement. His last work was his 'Venetian Fishermen,' a picture that has served to raise his name as that of the greatest artist of his age in the peculiar walk which he had chosen. The general admiration which it excited when exhibited at Paris, was however mingled with mournful regret at the fate of the artist himself; for he had previously put an end to his life at Venice, where he had resided several years, and where he drowned himself, March 20th, 1835, in his 38th year.

ROBERT, HUBERT, an artist, celebrated for his admirable architectural compositions and subjects of that class, was born at Paris, in 1733.

On quitting school, Robert applied himself assiduously to his studies. In 1753 he set out for Rome, and spent twelve years in that city, occupied not merely in making drawings and views of nearly all the numerous architectural monuments, but studying their character completely. Thoroughly impressed with the poetry of such subjects, he enabled others to feel it likewise, by the peculiar charm with which he invested them and by his felicitous treatment, so different from that whose chief merit consists in literal exactness and cold correctness. On his return to Paris, he was immediately elected by the Academy, and his reputation became established as a master-genius, — one whose productions formed an epoch in that department of the art which he had selected.

Among his numerous works are many chefs-d'œuvre of first-rate excellence. Two of the most remarkable for the singularity of the idea are those representing the Musée Napoleon, the one in all its pride and pomp, and the other, an architectural wreck, as it may perhaps present itself to the eye after the lapse of centuries.

Robert was a true artist, an enthusiast in his profession. He was indeed one of those fortunate persons whose existence seems to form an exception from the common lot of mortals; happy in himself, happy in his union with a most amiable woman, possessing a source of constant enjoyment in his art, his life passed in one uninterrupted tenor; in a calm, undisturbed even by the stormy period of the Revolution. Nor was he less happy at its close, for he died almost without a struggle, and with pencil in his hand, April 15, 1808, at the age of seventy-six.

ROBERTSON, WILLIAM, was the son of a clergyman who for some time had the congregation in the old chapel of London Wall, and afterwards was one of the ministers of Edinburgh, where Dr. Robertson was born in 1721. His mother was daughter of Pitcairn of Dreghan. In 1743 he was presented to the living of Gladmuir in East Lothian. He distinguished himself as a preacher, and also as one of the most powerful speakers and most eminent leaders in the General Assembly of the Church of Scotland. In addition to his professional pursuits, he applied himself to historical studies, and in 1759 published his 'History of Scotland during the reigns of Mary and of King James VI. till his accession to the crown of England, with a Review of the Scottish History previous to that period, and an Appendix containing original Papers,' 2 vols. 4to., 1759. The work was very well received, and went through numerous editions in the author's lifetime. In 1761 Dr. Robertson was made one of the king's chaplains, and in 1762 he was appointed Principal of the university of Edinburgh. Two years after he was made historiographer to his majesty for Scotland, with a salary of 200*l*. In 1769 he published his 'History of Charles V.,' in 3 vols. 4to., a work which raised his reputation still higher, and which, from the general interest belonging to the subject, was very popular; it was immediately translated into several languages. The introductory part consists of an able sketch of the political and social state of Europe at the time of the accession of Charles V., a most important period which forms the connection between the middle ages and the history of modern European society and politics. This part of the work has been deservedly admired for the comprehensiveness of its views, for clearness of exposition, and graphic power; but the narrative of the reign and age of Charles is his master-piece. For his 'History of America,' 2 vols. 4to., 1777, Robertson obtained, through several friends, much valuable information from the Spanish and other archives. In 1785 he published some valuable 'Additions and Corrections to the former Editions of the History of Scotland.' In one of these additions, after saying that the licentious conduct of the clergy previous to the Reformation, a conduct so much in opposition to their vows of celibacy and their assumption of superior holiness, was perhaps the first thing that excited suspicion as to the truth of the doctrines which they taught, he justly observes that when the Reformation had gained the ascendency in various states, 'the form of ecclesiastical polity which was introduced in those states was modelled in some measure upon that of the civil government, as it had already happened on the first establishment of Christianity in the Roman empire. Thus the episcopal form was retained in England, in the kingdoms of Sweden and Denmark, and in some parts of Germany, as most consistent with the spirit of monarchy; whilst in Switzerland and the Netherlands the principle of equality was established, as being more suitable to the spirit of a republic.'

His celebrity as an author, and the powers which he displayed as a party chief in the church, where his influence was unbounded, gave rise to a proposition from the court, at the end of George II.'s reign, having for its object his promotion to the dignities of the English church. This (says his biographer, Dugald Stewart) met with such a repulse as effectually prevented a repetition of the attempt.

In 1791 Dr. Robertson published an 'Historical Disquisition concerning the Knowledge which the Antients had of India, and the progress of Trade with that country previous to the Discovery of the Cape of Good Hope.' This agreeable and well written essay is now nearly superseded by more recent works.

Dr. Robertson died at Grange House, near Edinburgh, in June, 1793. He is justly reckoned among the best British historical writers. His style is easy and flowing, his language correct, his opinions enlightened and sober, his investigation most diligent, and his expressions temperate. Hume, who was his intimate friend notwithstanding the difference of their opinions, greatly extolled Robertson's 'History of Scotland,' and Gibbon has borne ample testimony both to his accuracy and his style.

The works of Robertson have been lately published together in French, 'Œuvres complètes de W. Robertson, précédées d'une Notice par J. A. C. Buchot,' 2 vols. large 8vo., Paris, 1837.

ROBERVAL, a French mathematician, whose proper name was **GILES PERSONIER**. He was born in 1602, at a place called Roberval in the diocese of Beauvais, and having completed an extensive course of study, he came, in 1627, to Paris, where he connected himself with Père Mersenne and other learned men of the age, among whom his talents soon acquired for him considerable reputation. He was chosen professor of mathematics in the college of Gervais, which had been founded by Ramus at Paris, and, together with this appointment, he was allowed to hold, after the death of Morin, the chair of mathematics at the college of France.

The *Method of Indivisibles*, which forms a link between the antient geometry and the fluxionary or differential calculus, had been (1635) made public in Italy by Cavalleri, who is always considered as its inventor. In a letter to Torricelli however (1644), Roberval states that he himself had long before that time discovered a similar method of investigating propositions; and he adds, that he kept his processes to himself, in order that he might have a superiority over his rivals in solving such problems as were proposed to them. The statement may be correct, but if so, it happened that the French mathematician, by his reserve, like many others in similar circumstances, lost the honour which he might have obtained; a just punishment, observes Montucla, for those who, from such unworthy motives, make a mystery of their discoveries. At the end of the treatise of Roberval on this subject, there is explained a method of finding the areas of spaces comprehended between curvelines of indefinite length, and it may be that the credit of the discovery is due to him, though it is right to observe that the investigation of such areas had been made in England by James Gregory and Dr. Barrow before the publication of Roberval's work. Curves with infinite branches, and which admit of an expression for the area between them, were called Robervallian lines by Torricelli.

Roberval discovered an ingenious method of determining the direction of a tangent at any point of a curve-line by the rule for the composition of forces or motions; but he applied it only to the conic sections in which the component forces are supposed to act in the directions of lines drawn from the point in the curve to the foci. It appears that Torricelli laid claim to the first discovery of the method, which he asserts that he had made in 1644, but Roberval states, in a letter to the Italian philosopher, that he was acquainted with it in 1636, and that in 1640 he had communicated it to Fermat.

As early as the year 1616, P. Mersenne suggested the idea of the cycloid, and having made some fruitless attempts to find its area, he proposed the subject to Roberval in 1628; the latter, not succeeding immediately, abandoned the research, and apparently thought nothing of it during about ten years. At the end of that time, the question being revived, he resumed the inquiry with the advantage of greater experience, and fortunately discovered a method by which the area might be determined. Descartes afterwards proposed to Roberval and Fermat to determine the position of a tangent to the cycloid, and the latter soon resolved the problem, but the former appears to have failed, or to have succeeded with difficulty, and only after many trials. He subsequently however discovered the rules for finding the volumes of the solids formed by the revolution of a cycloid about its base and about its axis.

In 1646, Descartes, Roberval, and Huyghens attempted at the same time to investigate the duration of the oscillations made by planes and solids moving about an axis; and here Roberval appears to have been more successful than his competitors, though the state of science was not then sufficiently advanced to allow any of them to attain a solution which should be applicable to every kind of vibrating body.

None of Roberval's works were printed during his life, except a treatise on Statics, which was inserted by Mersenne in his 'Harmonie Universelle.' The others were published by his friend the Abbé Galois, in 1693, among the mathematical and physical works in the old 'Mémoires' of the Academy of Sciences. These relate chiefly to the subjects above mentioned, and include a treatise on the 'Recognition and Construction of Equations,' a work of little utility, since it is formed agreeably to the ideas of Descartes and Fermat, and is expressed in the language and notation of Vieta. Among them also is an account of a new kind of balance (a sort of steelyard) which Roberval had invented, and which was thought to be useful in finding the weight or pressure of the air.

Roberval, unfortunately for his fame, appears among the opponents of Descartes in matters relating to algebra: he is said to have made some objections to the theorems of his countryman in the construction of equations and concerning the nature of the roots; but the objections are without foundation, and serve only to expose his own jealousy and obstinacy.

To Roberval is ascribed the reply, 'Qu'est ce que cela prouve?' when, having been present at the representation of a tragedy, some one asked what impression it had made on him. The story is perhaps untrue, but such a circumstance is not improbable, since, in those days, science was profoundly studied, and the mathematicians were so completely absorbed in their pursuits, that they had little time to spare for other subjects. It is said that Roberval could never express his ideas with clearness and precision, and certainly readers well acquainted with the antient methods of investigation can with difficulty follow him in hi
demonstrations.

He was elected a member of the Academy of
when the latter was formed (1665), and he died in
1675.

ROBES, MASTER OF THE, an officer of th
hold who has the ordering of the king's robes. B
51 Henry III., the 'Gardein de la Garderobe de
warden of the king's wardrobe, was to make accom
in the Exchequer, on the feast of St. Margaret.
queen, the designation of the office is changed to
mistress of the robes. The office has always bee
great dignity. High privileges were conferred up
King Henry VI., and others by King James I., who
the office of master of the robes into a corporation.

**ROBESPIERRE, FRANÇOIS MAXIMILI
SEPH ISIDORE**, was born at Arras in 1759. Hi
a provincial advocate of no reputation, quitted
during the infancy of his children, who were not lo
wards left in a desolate condition by the death
mother. François Maximilien was the eldest, a
gustin Bon Joseph the second son: the third chi
daughter. Augustin imitated his brother, and
with him; the daughter lived in quiet respectabil
became a pensioner of the state.

Through the kindness of the bishop of Arras,
pierre was well educated at Paris. He studied j
dence; and having returned to his native town,
his father's profession, in which he gained some
tion. By his legal talents, and his situation as p
of the academy at Arras, he obtained an influence,
which, on the summoning of the States-General
he was elected a deputy of the tiers-état. No
was he elected, than he went to Versailles t
on his duties. Within the Assembly, for several
after its meeting, he was of little importance; wit
doors he gradually gained authority by gathering id
adventurers round him in the coffee-houses, and har
them on liberty and equality. It was by dexterit
dress, and the coincidence or adaptation of the
which he expressed, to those of his low, disconten
excited hearers, that this authority was raised. He
physical advantages to assist him: he was a shor
nificant-looking man; his features small, his com
pale, his face deeply marked with the small-pox.
voice harsh, shrill, and disagreeable. Notwit
these disadvantages, he increased in popular estim
was on the 17th of June, 1789, that he delivered
speech in the Assembly. From that time he dail
aside more and more of the backwardness and rese
he had hitherto maintained: he clearly saw that th
ness and want of energy in the government were
that he might with safety assert in the National A
the most violent democratic opinions, and throw th
lace into excitement. His importance in the A
in a great measure attributable to the prominen
he played in the Jacobin Club. [JACOBINS.] T
already contained so many members, that the large
in which its meetings were held was continually fil
it had corresponding affiliated societies throughout
vinces, which disseminated its revolutionary views a
jects, and rendered its power most formidable. H
Robespierre's principal scene of action; here he
every attribute of monarchy, and denounced those wh
control the people as conspirators against their
knowing that the pikemen of the suburbs, bloodthi
ungovernable, took the speeches of the Jacobins f
word of command. Robespierre laid down this p
'that France must be revolutionised;' and for thi
he laboured with a determination which his opponen
find no means of diminishing. It was certain
could not be tampered with; and the Jacobin new
daily overflowing with his praises, surnamed hi
Incorruptible.' His exclusion from the Legisla
sembly, to which he was rendered ineligible by a
which he himself had joined, enabled him to de
whole time and energies to the direction of the
Club. Its violence had somewhat diminished, but i
was increased by the enrolment of many of the m
officers, who could carry out its projects by their a
(Thiers.) At this time he was named Public Ac

When the attack was made upon the Tuileries
1792), Robespierre was not present; and for t

afterwards he forsook the Club and remained in seclusion. It was his custom neither to take an active part in the great overt acts of massacre or rebellion, nor to appear immediately after their commission; but rather to pause awhile, that he might see by what means they might best be turned to the promotion of his political objects, and the increase of his own popularity. It was with joy that he saw the National Assembly suspend the royal authority and call upon the nation to elect a convention which should determine on a new form of government. He became a member of the Convention; and on its opening (Sep. 21, 1792), seated himself on the 'montagne,' or higher part of the room, occupied by the most violent, which was also rapidly becoming the most powerful party. It was now that Robespierre first appeared in the foremost rank, which comprised the most powerful men: until now, notwithstanding all his efforts, he had had superiors even in his own party;—in the days of the Constituent Assembly, the well-known leaders of the time; during the continuance of the Legislative Assembly, Brissot and Péthion; and, on the 10th of August, Danton. In the first assembly he could attract notice only by the profession of extravagant opinions; during the second he became more moderate, because his rivals were innovators; and he maintained peace before the Jacobins, because his rivals called for war. Now, as we have said, he was in the first rank, and his chief aim was to annihilate the Girondins, who hoped, on the other hand, that the eminence he had attained was insecure as well as high, and that he might be overthrown himself. Barbaroux, Rebecqui, and Louvet dared to accuse him of seeking to be dictator. But the time had not come for accusations to be successful; the tide of his popularity had not turned. He demanded time to prepare his defence, and absented himself for eight days both from the Convention and the Jacobin Club. During this absence the Jacobins protested his innocence and intimidated his accusers, the excitement in the Convention subsided, and on his re-appearance he was triumphantly exculpated.

At this time the king was in prison, but his days were drawing to a close. Robespierre vehemently combated those who either asserted the necessity of a trial or declared the king inviolable: he demanded that he should be beheaded at once, and promoted unscrupulously the execution of his whole family. The death of the king augmented both party strife and private bitterness; each faction and each leader had some rival to destroy. The Montagnards struggled with the Girondins for supremacy, gained their end, and massacred their opponents. The kingdom was chiefly governed by the Committee of Public Safety [Committee of Public Safety], of which Robespierre, Couthon, and St. Just became the triumvirate. Their schemes for a moral regeneration will be found in all the histories of the time, and also an account of Robespierre's presidency at the great public acknowledgment of the existence of a Deity. This took place when his career was nearly run, when there were divisions in the Montagne, where he had lost the support of many who, though they had been rivals, had been likewise powerful allies, when Marat had been assassinated, when he had sanctioned the execution of Péthion and Danton and Desmoulins, when he had put a countless host of victims to death, and raised a proportionate number of enemies. In July, 1794, his adversaries became too strong for him: Billaud-Varennes, one of his own party, jointly with the remnant of the Dantonists, who still were furious because of the execution of their leader, accused Robespierre of seeking his own aggrandizement by the sacrifice of his colleagues. In vain Robespierre retired, in vain he took forty days to prepare his defence, in vain he strained every nerve to refute their charges. After a scene of frightful excitement, he was condemned to death, his brother, Couthon, St. Just, and Lebas being included in the same condemnation. Robespierre was separated from the other prisoners, and led to the gaol at the Luxembourg. Here accident gave him a chance of escape. The gaoler, who was his friend, released him; he marched against the Convention with a number of soldiers and partizans, and it is not impossible that he might have re-established his power, if he had possessed courage, and his allies dexterity. As it was, he was again seized, and having blown his jaw to pieces, in an unsuccessful attempt to destroy himself, was dragged groaning to the guillotine, amidst the taunts and acclamations of the people.

The characters of few men have been more deservedly decried than that of Robespierre. He was totally without any great quality; he was cowardly, cruel, and vain; 'one of the most intimate compounds of self-esteem and circumspection that ever met in the same character.' His success, which was partly due to his egotism, 'his excessive caution not to commit himself, made him the safest guide and model for all that multitude of cautious egotists which form so large a portion of human society.' (*Edin. Rev.*, vol. lxxii., p. 428.) 'He had another great source of strength in being the very apostle and prolocutor of the populace, of that vague and indefinite religion which Rosseau had created, and which then enjoyed so immense a popularity—a religion of sentiment without belief.' He was honest in his efforts for the democratic cause, he never sought money, and he well deserved the name of 'Incorruptible.' He long depended on his sister for support, and died worth fifty francs. The powers of his mind, his judgment, and his oratory have been frequently underrated; he must have been at least plausibly eloquent: he chose with adroitness the topics upon which he spoke; he was acute, and had considerable foresight. But on the whole, his low and vile qualities so greatly predominated, that he was not only the terror of the monarchical and aristocratic party, but he likewise injured the democratic cause, for he was guilty of no small portion of that violence and cruelty which rendered a reaction inevitable.

(Thiers, *Hist. French Rev.*; Mignet; Walter Scott, *Hist. of Nap.*, vol. i.; Carlyle, *Hist. French Rev.*; Mad. de Stäel, *Thoughts on the French Rev.*; *Ed. Rev.*, vol. lxxii.; *Biog. Universelle.*)

ROBIN HOOD. [Hood, Robin.]

ROBI'NIA, a name given to a genus of plants in commemoration of John Robin, a botanist in the time of Henry IV. of France. This genus is known by having an inferior perianth; teeth of calyx 5, lanceolate, two upper ones shorter and approximate; corolla papilionaceous; ovary with from 16 to 20 ovules; style bearded in front, and legume subsessile and many-seeded. They are North American trees, bearing nodding racemes of white or rose-coloured flowers. The genus Robinia formerly comprehended the plants now included under *Caragana*, from which it is distinguished by its long gibbous legume and unequally pinnate leaves.

The best known species of Robinia is the *R. pseudacacia*, the Bastard or False Acacia, or *Locust-tree*. It has stipular prickles, with loose pendulous racemes of white sweet-smelling flowers, which, as well as the legumes, are smooth. This tree, which is now so well known, was first grown in Europe by Vespasien Robin, the son of the botanist, after whom the genus was named, in the Jardin des Plantes at Paris. It was named locust-tree by the missionaries, who supposed it to be the same tree as that which grows in Asia, and is supposed to have produced the locusts spoken of in the New Testament. It was one of the first trees received in Europe from North America, where it grows in great abundance. It grows in the Atlantic States of North America, but it is very abundant in the south-west, in the valleys of the Allegheny Mountains. It is also found in the Western states and in Upper and Lower Canada.

Since its first introduction into Europe, this tree has met with very different treatment, at one time being extolled as the most valuable of trees, at another time condemned as worthless. This has arisen in a great measure from the soils and situations in which it has been accidentally cultivated. It has always been known in America as affording an exceedingly hard and durable wood; hence it has been recommended to be cultivated on this account, but the great tendency which this tree possesses to branching and its seldom attaining a great size render it impossible to obtain from it timber of a useful kind. In America it is used for making posts, and occasionally trees are found large enough to be employed in ship-building; but its greatest consumption is for making trenails, by which the timbers of ships are fastened together, and for this purpose large quantities are used in the royal dock-yard at Plymouth, which are imported from America.

Cattle are fond of the young shoots, and on this account it has been recommended to be cultivated as forage. At one time it was thought to be an excellent tree for planting on the banks of rivers and canals, as the roots, being very large and spreading, would bind the soil together. In 1823, Cobbett wrote on this tree, recommending it strongly in his various publications. He imported immense quantities of the seeds from America for the purpose of growing the plants for sale. He stated that in this way he had distributed in Great Britain more than a million of plants. His praises of the tree were extravagant in the extreme, and it has failed to answer most of the promises that he held out.

The tree is of rapid growth when young, and forms heartwood at a very early age. In America it attains a height of 70 or 80 feet, but in this country it is seldom seen so high. Its tendency to form branches, even when young, prevents its being used for hop-poles as recommended by Cobbett.

The roots and other parts of the plant, like many of its order (Leguminosæ), contain a saccharine principle, which accounts for the nutritive properties of the leaves. In St. Domingo the flowers are used for making a distilled liquor, which is said to be very delicious. It folds up its leaves at the approach of night.

The tree grows best on a soil of sandy loam, rich rather than poor; a good garden soil is the best. It should not be planted in exposed situations, as, from the great brittleness of its branches, it is likely to be destroyed by winds. It may be propagated by cuttings from the roots or by planting large truncheons or suckers, but producing it from seeds is the best mode. The seeds should be sown in the spring, and in the summer of the following year they may be transplanted. The seeds will not retain their vitality more than two years. American seed should be always used, as it does not come to perfection in this country.

There are two other species frequently cultivated in this country, *R. viscosa*, Clammy Robinia, and *R. hispida*, Hairy Robinia, or Rose Acacia. The former is characterised by the sticky secretion with which it is covered, and which has been discovered to possess a peculiar vegetable principle; the latter, which is the smallest of the three species here mentioned, has very large flowers, and forms a very ornamental shrub when grown on an espalier rail or against a wall.

ROBINS, or ROBYNS, JOHN, an English astronomer and mathematician, who was born in Staffordshire, about the close of the fifteenth century or the beginning of the sixteenth, as it appears he was entered a student at Oxford in 1516, and educated for the church. In MS. Digby, 143, are preserved several inedited tracts by Robins, and from a note at the end it appears that he was of Merton College. It seems that, in common with many others of that college, he devoted himself to the study of the sciences, and he soon made such a progress, says Wood, in 'the pleasant studies of mathematics and astrology, that he became the ablest person in his time for those studies, not excepting his friend Recorde,' whose learning was more general. Having taken the degree of bachelor of divinity, in the year 1531, he was the year following made by King Henry VIII., to whom he was chaplain, one of the canons of his college in Oxford. In December, 1543, he was made a canon of Windsor, and afterwards one of the chaplains to Queen Mary, who highly esteemed him for his learning. He died on the 25th of August, 1558, and was buried in the chapel of St. George at Windsor. He left behind him several works in manuscript, of which two, 'De Culminatione Stellarum Fixarum,' and 'De Ortu et Occasu Stellarum Fixarum,' are preserved in MS. Digby, 143, in the Bodleian Library. According to Wood, Sir Kenelm Digby also possessed three other tracts by Robyns, viz.: 1, 'Annotationes Astrologicæ,' lib. 3; 2, 'Annotationes Edwardi VI.;' 3, 'Tractatus de Prognosticatione per Ecclipsin;' and Wood adds that these were also in the Bodleian Library. We suspect Wood is here in error, for in the sale catalogue of the library of George, earl of Bristol, sold by auction in April, 1680, a copy of which is in the British Museum, we find an account of several manuscripts said formerly to have belonged to Sir Kenelm Digby, and among these (No. 49) is 'Johannis Robyns Annotationes Astrologicæ.' We are inclined to think that Wood may have taken the titles from the catalogue of Thomas Allen's library, in the Ashmolean Museum, nearly the whole of which came into the hands of Kenelm Digby, and that the two titles of 'Annotationes' do in reality belong to the same book. We are not aware that any copy of this work of Robyns's is now in existence, although there are some extracts from it in MS. Bodl. 3467, and the loss of it is perhaps not much to be regretted. Wood slightly refers to a book by Robyns under the title of 'De Portentosis Cometis,' but he says that he had never seen a copy. Bale however mentions having seen one in the Royal Library at Westminster, and this copy is now in the British Museum. Sherburne, in the appendix to his 'Manilius,' mentions another in the possession of Gale, and this is now in the library of Trinity College,—O. i. 11. We find also that there is still another copy in the Ashmolean Museum, MS. No. 186. The preface to this latter work, which is partly plagiarised from Cicero, is printed in Halliwell's 'Rara Mathematica,' p. 48-54.

ROBINS, BENJAMIN, a celebrated mathematician and artillerist, was born at Bath, in 1707, of parents who were members of the society of Friends, and in such humble circumstances as to be unable to give their son the benefits of a learned education. By the aid however of some occasional instruction and a mind by nature formed to comprehend readily the processes of mathematical investigation, he early attained to a considerable proficiency in the pure sciences; and, as the best means of being enabled to prosecute his favourite studies, he determined to establish himself in London as a private teacher. Some specimens of his skill in the solution of problems having been forwarded to Dr. Pemberton, this learned mathematician conceived so favourable an opinion of his abilities as to encourage him in his design; and accordingly, about the year 1725, Mr. Robins came to town, in the garb and professing the doctrines of a Quaker. The former, after a time, he exchanged for the ordinary dress of the country.

In the metropolis, and apparently in the intervals of leisure which his employment as a teacher afforded, Mr. Robins applied himself to the study of the modern languages, and diligently cultivated the higher departments of science by reading the works of the antient and the best modern geometers; these he appears to have mastered without difficulty, and in 1727 he distinguished himself by writing a demonstration, which was inserted in the 'Philosophical Transactions' for that year, of the eleventh proposition in Newton's treatise on quadratures.

During the following year he published, in a work entitled the 'Present State of the Republic of Letters,' a refutation of John Bernoulli's treatise on the measure of the active forces of bodies in motion, a subject which had been proposed as a prize question by the Royal Academy of Sciences at Paris, and successfully answered by Maclaurin. The foreign mathematician had endeavoured to support the hypothesis of Leibnitz, that the forces are proportional to the squares of the velocities which they produce, while both Maclaurin and Robins were in favour of the original opinion of Descartes, that the forces are proportional to the velocities simply.

About this time Mr. Robins began to make those experiments for determining the resistance of the air against military projectiles, which have gained for him so much reputation. He is said also to have directed the energies of his mind to the construction of mills, the building of bridges, draining marshes, and making rivers navigable; but it does not appear that he was ever employed in carrying such works into execution. The methods of fortifying places became a favourite study with Mr. Robins, and, in company with some persons of distinction, probably his pupils, he made several excursions to Flanders, where he had opportunities of examining on the ground the works of the great masters in the art.

In 1734, the celebrated bishop of Cloyne, author of the 'Treatise on Human Knowledge,' published a small work called the 'Analyst,' in which, without intending to deny the accuracy of the results, it is attempted to be shown that the principles of fluxions, as they were delivered by Sir Isaac Newton, are not founded upon strictly correct reasoning, inasmuch as it is assumed that the ratio between two variable quantities may have a finite or infinite value when the quantities are nascent or evanescent; that is, as the objector supposes, when both quantities become zero. The objection is founded on a misunderstanding of the subject, for by the term nascent or evanescent is meant, not that each quantity is nothing, but that both are infinitely small, or that they are less than any thing assignable; in which case one of them may, notwithstanding, exceed the other in magnitude a finite or even an infinite number of times. The talents of both Maclaurin and Robins were employed in answering the objection; and for this purpose the latter published, in 1735, 'A Discourse concerning the Certainty of Sir I. Newton's Method of Fluxions, and of Prime and Ultimate Ratios.' It is easy to imagine however that great difficulty would at first be felt in admitting a principle so different from any which occurs in the antient geometry; and, before the subject was set at rest, Mr

Robins added to the first, two or three other discourses explanatory of the calculus.

In 1738 he wrote a defence of Newton against an objection on the subject of the sun's parallax which occurs in a note at the end of Baxter's 'Matho;' and, in the following year, he published some remarks on Euler's treatise of 'Motion,' on Smith's 'Optics,' and on Dr. Jurin's discourse concerning vision.

Mr. Robins's principal work, entitled 'New Principles of Gunnery,' was published in 1742. To this is prefixed an account of the rise and progress of modern fortification, and a history of the invention of gunpowder, with a statement of the steps which had been taken towards a knowledge of the theory of gunnery. Having then determined the value of the explosive force of fired gunpowder and the effect of the heat and moisture of the atmosphere on that force, he proceeds to describe the ballistic pendulum which he had invented, with the manner of employing it in determining the velocities of shot when the guns are charged with given quantities of powder; and he treats at length of the resistance of the air on shot and shells during their flight, a subject till then but little understood. This work had the honour of being translated into German, and commented on by the learned Euler. Some of the opinions advanced in it being questioned by the author of a paper in the 'Philosophical Transactions,' Mr. Robins was induced to reply to the objections, and to give several dissertations on the experiments made by order of the Royal Society in 1746 and 1747; for these he was presented with the annual gold medal. A number of experiments in gunnery subsequently made by Mr. Robins were, after his death, published with the rest of his mathematical works, by Dr. Wilson, and the collection, which makes two volumes 8vo., came out in 1761.

Besides the pursuits of science, Robins appears to have been occasionally occupied with subjects of a political nature. A convention which had been made with the king of Spain, in 1738, respecting the payment of certain claims made by British merchants in compensation for the seizure of their ships and the destruction of their property by the subjects of that monarch, not being considered satisfactory, the opponents of the minister, Sir Robert Walpole, made it the ground of an inquiry into his conduct, and Robins wrote three pamphlets on the occasion. These gained for him considerable reputation, and a committee of the House of Commons being appointed to manage the inquiry, he was chosen its secretary; he did not however hold the post long, as a compromise took place between the opposing parties. About ten years afterwards (1749) Mr. Robins wrote, as a preface to the 'Report of the Proceedings of the Board of Officers on their Inquiry into the Conduct of Sir John Cope,' an apology for the unsuccessful issue of the action at Preston Pans in 1745.

Great difference of opinion exists concerning the share which Mr. Robins had in writing the account of Lord Anson's 'Voyage round the World' (1740-1744). The work was certainly commenced by the Rev. W. Walter, the chaplain of the Centurion, who was in that ship during the greater part of the voyage; but, on the one hand, it is said that the account of the reverend gentleman consisted chiefly of matters taken verbatim from the journals of the naval officers; and that Robins, using the statement of courses, bearings, distances, &c. as materials, composed the introduction and many of the dissertations in the body of the work. On the other hand, we are told that Mr. Robins was consulted only concerning the disposition of the plates, and that he left England before the work was published. It is scarcely probable that a clergyman professing to write the history of such a voyage should have merely copied a sailor's journal, and it may be reasonably supposed that the greater part of the work as it stood in the first edition came from his pen; while, with equal reason, it may be allowed that Mr. Robins added the introduction and the scientific notices. The first edition appeared in 1748, and four were disposed of in the course of that year.

Mr. Robins was offered, in 1749, his choice between two good appointments; the first, to go to Paris as one of the commissioners for settling the boundaries of Acadia; and the other, to be engineer in general to the East India Company. He accepted the latter, and departed in December for Madras, where he arrived in July, 1750. His intentions were to put the fortifications in a good state of defence, and he had actually prepared plans for the purpose when he was taken ill with a fever. He recovered from this attack, but soon afterwards fell into a declining state, and died on the 29th of July, 1751, at the age of forty-four years.

He left behind him the character of being one of the most accurate mathematicians of his age: and the interest which he took in astronomy may be inferred from his having availed himself of his interest with Lord Anson to procure a new mural quadrant for the Royal Observatory at Greenwich, and having taken with him to India a set of instruments for the purpose of making observations in that country.

Dr. Hutton relates that, in 1741, he was a competitor with Mr. Müller for the post of professor of fortification in the Royal Military Academy at Woolwich; and that the latter succeeded through some private interest in obtaining the appointment.

ROBISON, JOHN, was born in 1739, at Boghall in the county of Stirling. His father, who had been a merchant at Glasgow, but who then resided on his estate, intended that he should enter the clerical order, and accordingly he sent him, at eleven years of age, to the university of that city. Here the youth studied the classics under Dr. Moore, and moral philosophy under Dr. Adam Smith; and at the same time he received instructions in mathematics from Dr Robert Simson. He took his degree of M.A. in 1756, but he declined the church as a profession.

Being thus compelled to seek an occupation in some other line, he went to London in 1758, with a recommendation from Dr. Simson to Dr. Blair, a prebendary of Westminster, who was then desirous of obtaining some person to instruct the young duke of York in navigation, and to accompany his royal highness in a voyage to sea, an intention being entertained that the prince should serve in the royal navy. The project was afterwards abandoned, but Mr. Robison consented to embark on board the Neptune with a son of Admiral Knowles, who had just then received his appointment as a midshipman. This ship was one of a fleet destined to co-operate with the land-forces under General Wolfe in the reduction of Quebec; and during the voyage Mr. Knowles being promoted to the rank of lieutenant on board the Royal William, Robison, who was then rated as a midshipman, accompanied him. In May, 1759, the fleet arrived in the St. Lawrence, and Mr. Robison was employed in surveying the river and the neighbouring country; at the same time he had an opportunity of making observations concerning the effects produced by the aurora borealis on the magnetic needle.

The success of the expedition is well known; and on the return of the Royal William to England, Mr. Robison accepted an invitation from Admiral Knowles to reside with him at his seat in the country.

In 1762, lieutenant Knowles being appointed to the command of a sloop of war, Robison accompanied him in a voyage to Spain and Portugal, but after being absent six months he returned to England, and quitted entirely the naval service. His great friend and patron the admiral however recommended him to Lord Anson as a person qualified to take charge of Harrison's timekeeper, which, after the labour of thirty-five years, was considered fit to be used for the important purpose of determining the longitude of a ship at sea, and which it was proposed by the Board of Longitude to try during a voyage to the West Indies. In consequence of this recommendation, Mr. Robison, accompanied by a son of Mr. Harrison, sailed to Jamaica, where, on January 26, 1763, the chronometer (whose rate had been determined at Portsmouth, November 6th, 1762) was found, after allowing for that rate, to indicate a time less by 5″ only than that which resulted from the known difference between the longitudes of the two places; and on his return to England, April 2nd, 1763, that is, after an absence of one hundred and forty-seven days, the whole error was found to be but 1′ 54½″.

Mr. Robison, being disappointed in his expectations of promotion from the Admiralty, set out for Glasgow in order to resume his studies. Here, enjoying the friendship of Dr. Black and Mr. Watt, the former of whom was on the point of developing his theory of latent heat, and the latter of bringing forward his great improvements on the steam-engine, he felt himself irresistibly impelled towards the pursuit of the physical sciences.

On the removal of Dr. Black to Edinburgh, Mr. Robison was appointed to succeed him, and for four years he gave lectures on natural philosophy at Glasgow; but at the end of that time he accepted (1770) the appointment of secretary to admiral Sir Charles Knowles, who had been invited by the empress of Russia to superintend the improvements which that sovereign contemplated making in her navy. Two years after his arrival at St. Petersburg, Sir Charles became president of the board of admiralty, and Robison was made inspector of the corps of maritime cadets at Cronstadt, with a liberal salary and the rank of lieutenant-colonel in the Russian service. He gave no instructions, but his duty was to receive the reports of the masters, and to class the cadets in the order of their merits; this he performed for four years, but finding Cronstadt a dreary place of residence during the winter, he accepted the professorship of natural philosophy at Edinburgh, which had become vacant by the death of Dr. Russel. He arrived in that city in June, 1774, bringing with him two or three of the Russian cadets, whose education he had undertaken to superintend; and in the same year he gave a series of lectures on mechanics, optics, electricity, astronomy, &c. This course he continued to deliver annually during the rest of his life, except when ill health obliged him to appoint a substitute for the purpose, improving each subject from time to time by the introduction of every important discovery which it received from the researches of his contemporaries. The lectures are said to have been distinguished by accuracy of definition and clearness as well as brevity of demonstration; and the experiments by which they were illustrated, to have been performed with neatness and precision. But it has been objected to them that they were delivered with a rapidity of utterance which made it difficult for the students to follow him; that he supposed his pupils to possess a higher degree of preparatory information than they had in general attained, even when they had gone through the university course of study, and that the experiments were too few in number to serve the purpose intended by them.

It may be thought that the second objection might have been obviated by merely requiring, in the pupils who were to attend the course of lectures, an adequate portion of mathematical knowledge previous to their admission; but it is probable that the ground of the complaint lay, partly, in the difficulties inseparable from the communication of scientific instruction by general lectures. The result attained after a geometrical investigation on paper may be admitted by a reader who can take the time necessary to satisfy himself of the truth of the several steps and of their dependence on each other; but this is seldom possible when the investigation is delivered from the mouth of a lecturer, who must go on with his subject without waiting for the slow operations of the judgment in the mind of his auditor, and the consequences too often are that, at the expiration of the hour, the latter carries away only a number of ideas in a state of inextricable confusion. In former ages, when books were scarce, there was no other method of conveying instruction to a number of persons than that of general lectures; but at present such lectures can only be useful as auxiliaries in teaching the physical sciences, and probably the chief advantage to be derived from them consists in the opportunities they afford for exhibiting experiments which it may not be in the power of students individually to make. It seems to follow that such exhibitions should not be omitted whenever they can be made conducive to the illustration of the subject.

On settling in Edinburgh, Mr. Robison became a member of the Philosophical Society of that city. In 1785 he was attacked by a disorder which was attended with pain and depression of spirits, but he was only occasionally prevented from performing his duties and following his literary avocations. In 1798 he was made doctor in laws by the University of New Jersey; and in the following year, by that of Glasgow; and in 1800 he was elected a foreign member of the Academy of Sciences at St. Petersburg. In 1785 he wrote a paper which was published in the first volume of the 'Philosophical Transactions of Edinburgh,' on the determination, from his own observations, of the orbit and motion of the Georgium Sidus; and he afterwards wrote one which appeared in the second volume of the same work, on the motion of light as affected by reflecting and refracting substances which are themselves in motion. But his most important works are the numerous articles which, in 1793 and the following years, he contributed to the third edition of the 'Encyclopædia Britannica' and its supplement: a series of treatises which may be considered as forming a complete body of physical science for that time.

Mr. Robison was prevailed upon to superintend the publication of Dr. Black's lectures on chemistry, and they came out in 1803, but that science had undergone so great a change since the death of the learned lecturer, that the work excited little interest. In the following year he published a portion, containing dynamics and astronomy, of a book entitled 'Elements of Mechanical Philosophy;' but the substance of it, together with that of some MSS. which had been intended by the author to form part of the second volume, and also the principal articles which had been written for the 'Encyclopædia Britannica,' were collected by Dr., now Sir David, Brewster, under the title of 'A System of Mechanical Philosophy,' and published in 1822, with notes, in 4 vols. 8vo. This work is considered by the late Professor Playfair as firmly establishing the character of Mr. Robison for scientific attainments.

While Mr. Robison was on his journey to Russia in 1770, he was hospitably entertained by the bishop of Liége, who, with all his chapter, constituted a lodge of freemasons; and into this society our traveller was induced to enter. It is unknown from what source he obtained his information respecting its proceedings, but twenty-nine years afterwards he published a remarkable work containing 'A History of the German Illuminati,' whom he describes as the agents in a plot formed by the freemasons to overturn all the religions and governments of Europe. The work met with little attention, and Robison was charged with a degree of credulity scarcely to be expected in a person so well acquainted with the laws of philosophical evidence.

Having taken a slight cold, and suffered an illness of only two days' duration, Mr. Robison died on the 30th of January, 1805, in the 66th year of his age, leaving a widow and four children. He is stated to have been a person of prepossessing countenance, a good linguist, a draughtsman, and an accomplished musician; and it is added that his conversation was both energetic and interesting.

ROBORTELLO, FRANCIS, was born of a noble family, September 9th, 1516. He was educated at Bologna under the celebrated Romulo Amaseo, and he began about 1538 to teach the belles-lettres at Lucca. Five years afterwards he went to Pisa, where he lived during the next five years, and laid the foundation of his fame, which was soon spread over the whole of Italy. In 1549 the senate of Venice elected him successor to Battista Egnazio, professor of rhetoric there, whose advanced age obliged him to retire from public duties. In 1552 Robortello was promoted to the chair of Greek and Latin literature in the university of Padua, in the place of Lazaro Buonamici, who died in that year. Thence he removed in 1557 to Bologna, in order to undertake a similar office in that city. Having been appointed to pronounce here the funeral oration in honour of the emperor Charles V., who died in 1558, he is said to have forgotten the exordium, and to have been incapable of proceeding, which brought him into some disrepute. About this time he had violent disputes with Sigonius, in which Robortello appears to have been the aggressor, and which did not terminate till the senate of Venice employed their authority in imposing silence upon both. Robortello died at Padua, March 18th, 1567, in the fifty-first year of his age, so poor that he did not leave enough to defray the expenses of his funeral, which however was celebrated by the University in a style of great magnificence.

Robortello seems to have been naturally pugnacious, and he was continually involving himself in disputes with men superior to himself. He could not refrain from attacking such writers as Erasmus, Paulo Manuzio, Muretus, and Henry Stephens. He was however a man of considerable talent and learning, and he published several books of great utility. The following are his principal works: 1, 'Variorum Locorum Annotationes tam in Græcis quam in Latinis Auctoribus,' Venice, 1543, 8vo.; 'De Historica Facultate,' &c., Florence, 1548, 8vo., being several treatises on Greek and Roman literature, all of which are inserted by Gruter in his 'Thesaurus Criticus.' 3, 'De Convenientiâ Supputationis Livianæ Annorum cum Marmoribus Romanis quæ in Capitolio sunt; De Arte sive Ratione corrigendi Veteres Auctores Disputatio,' Padua, 1557, folio: 4, 'De Vita et Victu Populi Romani sub Imperatoribus Cæs. Augustis,' Bologna, 1559, folio. Besides these he published editions of Aristotle's 'Poetics,' the 'Tragedies' of Æschylus, the 'Tactics' of Ælian,' and Longinus 'On the Sublime.'

(Weiss in *Biographie Universelle.*)

ROBULI'NA. [FORAMINIFERA, vol. x., p. 348.]

ROBUSTI. [Tintoretto.]

ROCCA, in Italian, means a strong hold or fortified place, perched upon a rock or steep hill, a position common to many provincial towns in Italy. Rocca, properly speaking, means the castle or keep, but it has also become an appellative for the town or village which generally adjoins it. The appellative Rocca is most frequent in the Neapolitan and Papal states, and in Piedmont. The most notable places of this name are Rocca Morfina, in Campania, once the capital of the Aurunci: Rocca di Papa, on the Alban Mount, near Rome; Rocca Gorga, near Piperno; Rocca Rasa, and Rocca Vall' Oscura, two stations in the Abruzzo, on the high road from Naples to Sulmona, in the mountain tract which divides the valley of the Sangro from that of the Pescara; Roccabruna, in the province of Cuneo in Piedmont; Roccaforte, in the province of Mondovi; Roccabione, in the province of Cuneo, &c.

ROCCELLA. [Orchil.]

ROCHDALE, a parliamentary borough in the hundred of Salford, 12½ miles north-west of Manchester, and 202½ from the General Post-office, London, by the mail road through Dunstable, Northampton, Market Harborough, Leicester, Derby, Belper, Matlock, and Buxton to Manchester; in 53° 37′ N. lat. and 2° 10′ W. long.

The parish of Rochdale is one of the most extensive in the kingdom. It extends into Agbrigg wapentake, in the West Riding of Yorkshire, and comprises 58,620 statute acres; with a population, in 1831, of 74,427, of which 40,340 acres and 58,441 inhabitants are in Lancashire. The Lancashire part was formerly divided into four parts, now into ten townships, as follows:—

Former Division.	Present Division.	Pop. 1831.
Honorsfield or Hundersfeild	Blatchinworth and Calderbrook	4,221
	Todmorden and Walsden	6,054
	Wardleworth	9,360
	Whitworth and Brandwood	*
	Wuerdale and Wardale	6,754
Spotland	Spotland, further side	15,325
	Spotland, nearer side	
Castleton	Castleton	11,079
Butterworth	Butterworth	5,648
		58,441
	Yorkshire.	
Chapelry of Saddleworth cum-Quick		15,986
		74,427

Rochdale derives its name from the Roch (which flows into the Irwell, a tributary of the Mersey); it is called Recedham in the Domesday Survey. In the time of Edward III. some Flemings introduced the woollen manufacture into the parish; and two centuries afterwards, viz. in the reign of Elizabeth, it was still famous for its woollens. In 1610 re were no fewer than five fulling-mills established podden or Spotland brook in this parish.

town of Rochdale is situated on both sides of the Roch, into which, on the north bank, two brooks flow, ee brook just above, and the Spodden or Spotland k just below the town. That part of the town which is south side of the Roch is in the township of Castle- and is connected by three bridges with the more ex- e part on the north side of the Roch, which extends townships of Wardleworth and Spotland, and a small o the township of Wuerdale and Wardale. The s are irregularly laid out, and many of them are nar- nd inconvenient. Within the last fifteen years how- great improvements have taken place, several of the have been widened and otherwise improved, and a arket-house completed. The houses are chiefly of some of the best are built of freestone quarried in ighbourhood: the streets are well paved, and lighted ; and the town is supplied with water from four s in Castleton township. The old bridge over the (a stone bridge of three arches) has been widened and improved; about a quarter of a mile below it is another stone bridge of one arch, and just above it an iron bridge for foot passengers. There are several churches and chapels, episcopal and dissenting. The parish church was built within about a century of the time of Domesday Survey, and was dedicated to St. Cedd or St. Chad. It is partly in the early English style, with a few remains of Norman character in the interior. The nave and south aisle, and the tower, which is embattled and crowned with pinnacles, are of later date. The windows of the choir have rich tracery; and the font and many of the monuments are very antient. St. Mary's church was built in .740 as a chapel-of-ease to the parish church; it is a plain brick building. St. James's, built in 1814, is a Gothic stone edifice, with a square embattled tower. There are other churches or episcopal chapels (some of them erected of late years) in the outparts of the parish. There are in the town chapels for Presbyterians, Baptists (two), Methodists (Wesleyan, New and Primitive), Independents, the countess of Huntingdon's connexion, Unitarians, and Roman Catholics: all these, except the Presbyterian chapel, have been built or rebuilt in the present century.

The manufactures of this place are very important; they comprehend woollen goods, as baize, flannels, coatings, and friezes, and strong calicos and other goods in cottons; but the woollen fabrics form the staple. Hats are also made, and cotton yarn is spun. Coal is dug, and slates, flagstones, and freestone are abundantly quarried in the parish, and there are iron-works in Butterworth township. Steam-power is extensively employed by the manufacturers. There are two weekly markets; on Monday for manufactured goods, wool, oil, dye-stuffs, and grain; and on Saturday for provisions. There are three yearly fairs: on May 14th; on Whit-Tuesday; and on November 7th; all for cattle, horses, and pedlary. The Rochdale canal, which unites the duke of Bridgewater's canal at Manchester with the Calder and Ribble navigation near Halifax in Yorkshire, passes near the town on the south-east side of it.

The town is in the jurisdiction of the county magistrates. The lord of the manor holds a court baron every three weeks for the recovery of debts under 40*s*. There are a neat town-hall, used also as a news-room, and a commodious gaol called the New Bailey.

Rochdale was erected into a parliamentary borough by the Reform Act; and the boundary, as defined by the Boundary Act, coincides with the boundary laid down in a previous local police act, and is a circle drawn with a radius of three-quarters of a mile from the old market-place in the very heart of the town. Rochdale returns one member to parliament: the number of voters on the register for 1834-5 was 746; for 1835-6, 695.

The borough of Rochdale is a vicarage, one of the richest in the kingdom, at present in the archdeaconry and diocese of Chester; but to be transferred to Manchester when that see is erected. Its clear yearly value is estimated at 1730*l*., with a glebe-house: it is in the gift of the archbishop of Canterbury. The glebe comprehends 200 acres of land, a part of it built upon.

There were, in 1833, in the three townships of Castleton, Wardleworth, and Spotland, sixty-eight schools of all kinds for daily instruction, with 2289 scholars; and twenty-eight Sunday-schools, with 4036 scholars. Some of these schools are probably out of the town in the outparts of the townships. We have not included Wuerdale and Wardale township, as only a very small part of the town is in it. Four of the day-schools are endowed; one is a national school, the children of which attend also on Sunday.

Littleborough, in the parish of Rochdale, was a Roman post, but the remains of it have nearly or quite disappeared. Roman coins, and part of a statue of Victory, of silver, have been dug up. The mound of an antient castle, said to be of Saxon original, to which the township of Castleton owes its name, is mentioned in the 'Beauties of England and Wales.' In the chapelry of Saddleworth, in the Yorkshire part of the parish, are some Druidical remains. (Baines's *Hist. of Lancashire*; *Parliamentary Papers*.)

ROCHEFORT, a town and port of France, capital of an arrondissement in the department of Charente Inférieure, 300 miles south-west of Paris by the road through Orléans, Tours, Poitiers, and Niort; in 45° 56′ N. lat., and 0° 59′ W. long.

Rochefort was in the middle ages in the power of the English, from whom it was taken by Charles VII. Its capabilities as a naval station having attracted notice, works were commenced, in the reign of Louis XIV., in A.D. 1666; since which time the immense works carried on have rendered it one of the most important naval stations of France. An expedition against Rochefort was sent out from England, A.D. 1757, but from cowardice or mismanagement it ended in a disgraceful failure.

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* Not given in the Population Returns; probably included in one of the divisions.

The town stands in a low marshy district, which in the summer and autumn renders the town unhealthy: it is on the northern bank of the Charente, about ten or twelve miles from the sea; the river, though not very large, affords sufficient depth of water at all times to float the largest vessels. The town is regularly fortified, and the approach is defended by forts on the Isle of Aix, and at the mouth or on the banks of the river. The ramparts are planted with trees. The streets are well laid out, broad, and straight, and well lighted with lamps and reflectors; they are watered daily in the summer months by a forcing-pump from a large reservoir. Some of the streets are planted with poplars and acacias, and the principal of them terminate on the parade. The houses are well built, but low, so as less to impede the circulation of the air. The harbour is formed by the Charente. The arsenal is one of the most extensive and finest in the kingdom; it comprehends an armoury, a large dock for building, basins for repairing, and immense storehouses, extending more than 1300 feet, of every necessary for equipping vessels, a cannon-foundry, a ropewalk about 1250 feet long, a victualling-office, barracks, a depôt for convicts, with a saw-mill, and a mill which cleans the harbour, moves the cylinders for rolling out sheet-metal, and performs other work; and a fine naval hospital, including eighteen wards, besides the officers' apartments, and containing 1240 iron bedsteads. In the part of the harbour reserved for merchantmen, ships of 600 tons, fully laden, can come up to the quays. There is an Exchange.

The population of Rochefort, in 1831, was 10,332 for the town, or 14,040 for the whole commune; in 1836 it was 15,441 for the commune. Besides the business connected with the arsenal, vessels are fitted out for the cod fishery, and a considerable coasting-trade is carried on. The chief exports are wine, brandy, corn, and salt. There are three yearly fairs. Rochefort has two churches, three chapels, a general hospital, besides that for the navy, a foundling hospital, a high school, a school of navigation and hydrography, a school of naval medicine, schools of surgery and mathematics, schools on the monitorial system for drawing, singing, and music; a society of literature, science, and art; a public library of 1500 volumes, a library of 10,000 volumes for the navy, a cabinet of natural history, a botanic garden, and a theatre. A consistory of the Reformed (or Calvinistic) church is established here; and there is a Protestant Bible Society.

The arrondissement of Rochefort contained, in 1831, forty-seven communes, and was divided into four cantons or districts, each under a justice of the peace. Its population at that time was 48,836.

ROCHEFOUCAULD, or ROCHEFOUCAULT, LA. [CHARENTE.]

ROCHEFOUCAULD, FRANÇOIS, DUC DE LA, of a distinguished noble family of France, was born in 1613. He appeared early at the court of Louis XIII., and showed some talents and ambition, but was kept out of employment and favour by the jealousy of Cardinal Richelieu. In the early part of the subsequent reign of Louis XIV. he figured in the civil war of La Fronde. He attached himself to the party of the Duchess of Longueville, whose avowed admirer he was, and he was severely wounded at the siege of Bordeaux, and in the battle of St. Antoine at Paris. After Louis XIV. had firmly established the monarchical authority, La Rochefoucauld withdrew to private life. In this second part of his career he exhibited private virtues which atoned for the folly and violence of his younger years. He was intimate with Madame de la Fayette, and with Madame de Sévigné, who speaks of him, in her correspondence, in terms of real esteem. He died in 1680, with calm and christian-like resignation. The Cardinal de Retz, his contemporary and fellow-partizan, in his 'Memoirs,' says of him, that he was always irresolute in his temper; a good soldier, with no military talent; a bad courtier, though ambitious of figuring and meddling in intrigue; but at the same time he praises 'his natural good sense, the ease and mildness of his manners,' and says that 'he was a very upright man in private life.' La Rochefoucauld left several works, the principal of which are, 'Mémoires de la Régence d'Anne d'Autriche,' and his 'Maximes,' or 'Pensées,' for which he is best known as an author. This book has made much noise in the world; it has been abused, criticised, controverted, and yet no one can deny that there is a great deal of truth in it, though it generalises too much. La Rochefoucauld attributes all the actions of men, good or bad, to the moving-spring of self-interest. Friendship is an exchange of good offices, generosity is the means of gaining good opinion, justice itself is derived from the fear of suffering from the oppression of others. This may be all true, but still there are actions in which men can have no self-interest in view, in which they act from enthusiasm, or a strong sense of duty, or from benevolence, or some motive other than self interest; such are, for instance, the self-devotedness of the patriot, the perseverance of the upright man through good and evil report, the sacrifice made by pure love, and above all the calm resignation of the Christian martyr. These and other similar instances La Rochefoucauld has not taken into account, because probably he had seen no specimen of them. La Rochefoucauld has accounted for most actions of a great proportion of mankind, perhaps by far the greater, and for so doing he has been abused, because, as a French lady observed, he has told every body's secret. He has placed himself, with regard to private morality, in the same predicament as Machiavelli with regard to political morality. [MACHIAVELLI.] J. J. Rousseau, who was certainly not free from selfishness, has abused La Rochefoucauld's Maxims, and yet in his 'Emile' he observes that 'selfishness is the main spring of all our actions,' and that 'authors, while they are for ever talking of truth, which they care little about, think chiefly of their own interest, of which they do not talk.' La Fontaine, in his fable (b. i., 11) 'L'Homme et son Image,' has made an ingenious defence of La Rochefoucauld's book.

La Rochefoucauld's 'Maximes' have gone through many editions. The 'Œuvres de la Rochefoucauld,' 1818, contain, besides his already published works, several inedited letters and a biographical notice.

Several other individuals of the same family have acquired an historical name, among others, Louis Alexandre de la Rochefoucauld, Peer of France, who embraced the popular part at the beginning of the great French revolution, and displayed considerable violence in his sentiments, notwithstanding which, after the 10th of August, he was massacred by the Jacobins as an aristocrat.

ROCHELLE, LA, a town in France, capital of the department of Charente Inférieure, 301 miles south-west of Paris by the road through Orléans, Tours, Poitiers, and Niort; in 46° 8′ N. lat. and 1° 8′ W. long.

La Rochelle was antiently a small town and fort belonging to the lords of Mauléon, from whom it was taken by one of the counts of Poitou. On the marriage of Henry II. of England with Eléonore of Guienne, heiress of Poitou, it came into the hands of the kings of England, from whom it obtained considerable municipal privileges. It was taken from the English by Louis VIII., A.D. 1224, was again ceded to them by the treaty of Bretigny, A.D. 1360, but finally recovered, A.D. 1372, by Duguesclin. Under the French kings the privileges of the town were further augmented; the importance of the place increased, and upon the acquisition of it by the Huguenots, A.D 1557, it became a sort of republic, and the stronghold of their party. It was besieged in 1574, by the duke of Anjou, but in vain: the garrison was commanded by La Noue. In 1627 it was again besieged by the royal forces under Louis XIII. and his minister Richelieu. By means of an immense barrier of piles carried across the entrance of the harbour, assistance from the sea was precluded, and the attempt of the English to succour the townsmen was defeated by the incapacity of the duke of Buckingham, the favourite of Charles I., who commanded the expedition. The townsmen, under the mayor Guitton, held out for thirteen months, but, after undergoing the most dreadful extremities from famine, were compelled to surrender, and the power of the Huguenot party was finally broken. Rochelle was fortified anew by Vauban, by order of Louis XIV., and is still maintained as a fortified town.

The town stands on the northern side of a small inlet of the Atlantic, which extends eastward about two miles into the land, and terminates, just above Rochelle, in a salt marsh. The entrance of this inlet, which serves as the roadsted or outer harbour of the town, is defended by forts;

approaches are further protected by the works on
of Ré and the Isle of Aix. The fortifications on the
e, though extensive, including nineteen large bas-
d eight half moons, are not reputed to be strong,
he sea side the security of the place is regarded as
e. There are seven gates. The town is well laid
streets are for the most part straight, broad, clean,
d with well-built houses adorned with porticos, but
reat elevation. There are several fountains, which
te to the cleanliness of the place. The squares are
numerous, but all of irregular form: the principal
ace de la Préfecture and the Parade, both planted
s. The promenade of Le Mail commands a fine
of the harbour and the sea. The principal public
s are the cathedral, the seminary for the priesthood,
op's palace, the town-hall, a fine Gothic building,
s of law, the Exchange, the post-office, the guard-
the departmental guard, the theatre, the curious
wer, the general hospital (or hospital of St. Louis),
an hospital, the office of the prefecture, the mint,
kets, the abattoir, or public slaughter-house, the
, and the elegant sea-bathing rooms erected in
here are four churches besides the cathedral, se-
pels, four nunneries, a Protestant church, a house
tion, one military and two other prisons, and an
or almshouse, besides the two mentioned above.
ck or inner harbour is in the south part of the town,
it is surrounded on nearly every side, and compre-
o basins, one (Le Hâvre), adjacent to the roadsted,
w water, and bounded by a range of fine quays;
d is closed by flood gates, by means of which the
are kept constantly afloat; this basin also is sur-
by quays. The Canal Maubec, which runs from
-eastern corner of this basin, divides the city into
s, which communicate by three bridges over the
hips of any burden can get up to La Rochelle at
er.

opulation of La Rochelle in 1831 was 14,632; in
14,857. The exports from the port compre-
y and other spirits, wine, salt, flour, cheese,
, and linen cloth· the imports comprehend
produce and groceries. The townsmen refine
in cotton-yarn, make pitch, tar, catgut, and gloves,
, and engage in the Newfoundland cod fishery.
two fairs in the year, each of five days. Besides
lishments already noticed, there are courts of law,
er of commerce and several administrative or
vernment offices, an academy of belles-lettres,
and arts; a high school or college, a school of
n, a drawing-school, and a school of midwifery; a
rary of 20,000 volumes, a museum of natural his-
a botanic garden; an agricultural society, a Pro-
le society, and some charitable institutions.

e is the head-quarters of the twelfth military di-
hich comprehends the departments of Charente
e, Deux Sèvres, and Vendée. The bishopric of
was transferred to Rochelle in 1665: the bishop
gan of the archbishop of Bordeaux: his diocese
nds the department of Charente Inférieure. The
ement of Rochelle comprehends fifty-five com-
nd is divided into seven cantons or districts, each
justice of the peace. The population in 1831 was

lle salt, a purgative medicine of some reputation,
vered by M. Seignette, an apothecary of Rochelle,
s name. It is sometimes called Seignette salt.
well known from his graduation of the thermo-
in other respects, and Billaud-Varennes, the con-
t, were natives of Rochelle.

ESTER, an antient city in the county of Kent,
he south or right bank of the Medway, imme-
ent to the parliamentary borough of Chatham
], with which it forms one continuous town: it is
from the General Post-office, London, by the road
Dartford and Gravesend; and nearly the same dis-
direct line.

ter probably existed antecedently to the Roman
at any rate antecedently to the conquest of the
of the island under Claudius, and its antient
is of Celtic origin, denotes that it was at a pas-
river. Its Roman and Saxon names, from
which by corruption the modern Rochester is
e given elsewhere. [KENT, vol. xiii., p. 192, col. 1.]

During the independence of the Saxon kingdom of Kent it was of importance both as the seat of a bishopric (established about A.D. 604) and as a place of strength situated at the passage of the Medway. It was destroyed by Ethelred, king of Mercia, A.D. 676, and by the Danes in the time of Ethelwulf, A.D. 839: it was besieged by the same enemies (A.D. 885), but relieved by Alfred, who drove the invaders to their ships. In the time of Ethelred II. (A.D. 986) it was besieged, but in vain, by that king, who had a quarrel with the bishop; and was sacked (A.D. 998 or 999) by the Danes. After the Conquest, William the Conqueror either built or more probably repaired and strengthened a castle here, and placed it under the command of his brother Odo, bishop of Bayeux. In the reign of William Rufus this castle was besieged and taken by the king; against whom Odo had rebelled. In the reign of Henry I. (A.D. 1130), and again in that of Stephen (A.D. 1137), and a third time in that of Henry II. (A.D. 1177 or 1179), the city was nearly destroyed by fire. In the civil war of John, the castle was taken by that prince from the insurgent barons (A.D. 1215), and retaken next year by the Dauphin Louis. In 1264 the town was taken, and the castle besieged and reduced to extremity, by the confederate barons under Simon de Montfort, Earl of Leicester, but he was obliged to raise the siege and march against the king. In the rising of the commons under Wat Tyler, the castle was assailed, with what success is not clear. Edward IV. was the last king who paid any attention to the repair of the castle. James II. embarked at Rochester when he fled to France after his abdication, A.D. 1688.

The town stands chiefly on a low narrow tract which borders the Medway, and is backed by the chalk hills, which rise from the river with a rather steep ascent. It consists of several streets irregularly laid out; the principal street leads from the bridge at the west end of the town into Chatham on the east side. On the western side of the Medway are Strood and Frindsbury, considerable portions of which two parishes have been added to the town both for parliamentary and municipal purposes. A part of Strood and also a small part of Chatham were previously in the city of Rochester. The streets are paved, and lighted with gas, and the houses commonly of respectable appearance. The environs are extremely pleasant, and in the outskirts of the town are a few handsome villas, and rows of neat modern houses built on the higher ground which rises from the low margin of the river.

The cathedral is situated on the south side of the High-street within the antient Priory gate. It consists of a nave with side aisles, a choir (the floor of which is raised ten steps above the floor of the nave), a principal transept, at the junction of the nave and choir, and a smaller transept at the east end of the choir. At the intersection of the principal transept is a central tower erected in 1825; at the western end of the church there appear to have been originally four low towers, two on each side the doorway and two at the extremities; of these only two now remain, which are of different style. On the north side of the choir, between the two transepts, but nearer to the principal one, is a low square tower, now in ruins, called Gundulph's tower. The dimensions of the building are as follows: length of the nave 150 feet; breadth with side aisles 66 feet; length of the choir 156 feet; making the total length of the church 306 feet; length of the principal transept 122 feet; of the smaller transept 90 feet; area of Gundulph's tower, inside, 24 feet square; walls of Gundulph's tower 6 feet thick. Extent of the west front of the cathedral 81 feet. The chapter-house is in ruins; a mean building, erected in the place of it, serves for chapter-house and library. The nave is part of the structure of Bishop Gundulph, who rebuilt the cathedral near the close of the eleventh century. The west front is a fine specimen of enriched Norman architecture; but the great west window is an insertion of perpendicular character, as are most of the other windows of the nave. The nave has Norman piers and arches, except in the part nearest the choir, where the arches are early English. The roof of the nave is now flat; but there are indications that it was intended at first to be vaulted. On the south side of the church are some other Norman portions, which appear to have been the cloisters, and some other of the usual monastic adjuncts. Most of the eastern part of the church is of plain early English architecture, of good composition, without much ornament: the details of the doors and of some other portions are very good: the roof of the choir and of both transepts is vaulted and groined, except in one part, which was never finished. The pillars of the choir are of Petworth marble. The crypt is very spacious, extending under the buildings of the choir; its character is early English, scarcely differing, in one part, from Norman. There are a few antient monuments, singular rather than beautiful, and much mutilated. The old altar-piece, a painting by West, of the Angels appearing to the Shepherds, is now in Chatham church. There are several chapels, in one of which the bishop holds his consistory court. The architecture and masonry of Gundulph's tower give reason to think that it is improperly ascribed to him. The interior of the cathedral, has lately (1841) been repaired, and in many places restored to its original beauty, by the present dean and chapter, who have exhibited equal taste and liberality in the improvements which they have suggested or sanctioned. Arches and windows for a long time filled up have been opened, especially in the north transept, which now forms a valuable study for the architect and antiquary, as a specimen of early English, not excelled, if equalled, by any in the kingdom.

There are two parish churches in Rochester, St. Margaret and St. Nicholas; they are not remarkable for their architecture, but each has a very antient stone font, and St. Margaret's contains several antient monuments. Within the city is a commodious Wesleyan chapel, and a meeting-house belonging to the Society of Friends.

There was probably a bridge at Rochester at a very early period, but there is no distinct mention of it till the time of Henry I., when it appears to have been of wood, with ten arches or spaces between the piers, and a total length of about 431 feet. The frequent damage sustained by this wooden bridge and its continual need of repair led to the erection of the present one (a little above the site of the more antient structure), which was completed in the reign of Richard II. It is a stone bridge of eleven arches, 560 feet long, with a stone parapet and balustrades. The conservators of the bridge are an incorporated body under the title of the 'Wardens and Commonalty of the new Bridge of Rochester,' and have considerable funds appropriated to the repair of the bridge. The approach to Rochester from the London side of the bridge is very striking.

The castle is on the bank of the Medway, just above the bridge. The outer walls were 20 feet high above the ground, and 7 feet thick, strengthened with towers, square and round, and defended by a ditch on every side except the west side, where it was washed by the Medway. These walls enclosed a quadrangular area nearly 300 feet square, and are, with their towers, now in ruins. In the south-eastern angle of the court was the keep, a massive building yet standing, about 70 feet square on the outside, and rising about 104 feet from the ground, with a tower at each angle rising 12 feet above the rest of the building; three of these towers are square, that at the south-east angle is round. On the north side near the north-eastern angle is another tower, through which was the entrance; it joins the keep, and rises about two-thirds of its height. This smaller tower covers half the breadth of the northern side of the keep, and projects from it about 18 or 20 feet. The roof and floors have been destroyed: there were originally three stories besides the vaulted basements: each story was divided into two apartments by a partition wall rising to the top of the keep, with open arches or doorways on each floor, and having a well 2 feet 9 inches in diameter curiously built into it, to which well there was access from each floor. The walls of the castle are of great thickness, built of Kentish ragstone, cemented with a grouting or mortar equal to the stone itself in hardness. The coigns are of Caen stone. The architecture is Norman, except perhaps the round tower at the south-eastern angle, which was rebuilt in the place of the original square one destroyed when King John besieged and took the castle. The four towers at the angles rose one story above the keep, and, as well as the keep itself and the entrance tower, were surmounted with a platform, with parapet and embrasures.

The other public buildings are, a commodious town-hall, with a market-house beneath, and a small gaol adjacent; a clock-house, built by Sir Cloudesley Shovel on the site of a former town-hall; a neat theatre; and the bridge chamber or record-room, opposite the east end of the bridge. There are some remains of the city walls; and part of the fortifications of Chatham, especially Fort Pitt, are within the city.

Strood and Frindsbury, considerable portions of which have been added to Rochester both by the Boundary and Municipal Reform Acts, are on the north-west side of the Medway; Strood on the London road, and Frindsbury a little to the north-east. Strood consists of one principal street of irregularly built houses; the place has improved considerably of late years; it has a neat church. Frindsbury consists chiefly of one long street. The church is on an eminence commanding a very fine prospect. There is a Methodist meeting-house. Upnor Castle on the Medway is in Frindsbury parish: it consists of an oblong central building, with a round tower at each end, and is surrounded by a moat; it was used during the late war as a powder-magazine.

The population of the borough, as enlarged by the above acts, was as follows, according to the census of 1831:—

Rochester old borough:	
St. Margaret's . .	5,025
St. Nicholas . .	3,050
Cathedral precincts . .	138
Strood intra . .	1,173
Chatham intra . .	505
	9,891
Addition—Strood extra and Frindsbury . .	2,167
	12,058

There are no manufactures in Rochester. Trading vessels come up to the bridge, where they discharge their cargoes, chiefly coals, which are conveyed up the river in small craft. The oyster fishery is carried on with great activity under the direction of the corporation, who have jurisdiction over the fisheries in the creeks and branches of the Medway. Considerable quantities of oysters are sent to London or exported to Holland; a considerable quantity of shrimps also are sent to London. There are two weekly markets, one, lately established, on Tuesday for corn, and one on Friday for provisions; and there is a monthly cattle-market. The fairs are almost disused. A canal was cut some years ago from the Medway to the Thames at Gravesend Reach, but the undertaking has not been profitable. This canal is carried through the chalk hills by a tunnel two miles and one furlong in length, which commences near Rochester bridge.

The corporation of Rochester, under the Municipal Reform Act, consists of six aldermen and eighteen councillors: the city is divided into three wards. The corporation have exclusive jurisdiction over all offences committed within the city and liberties. There are no quarter sessions; but petty sessions are held twice a week; and there is a court of requests having jurisdiction over several neighbouring parishes. Some other courts connected with the corporate jurisdiction are held. Rochester has returned members to parliament since the reign of Edward I. The number of voters on the register for 1834-5 was 967; for 1835-6, 1002.

The livings of St. Nicholas and St. Margaret are vicarages of the value of 389*l.* and 136*l.* respectively; there are glebe-houses to both. Strood is a perpetual curacy, of the clear yearly value of 238*l.*, and Frindsbury a vicarage, of the clear yearly value of 449*l.* They are all in the diocese and archdeaconry of Rochester.

There were in the city of Rochester and in the parishes of Frindsbury and Strood, in 1833, forty schools, in which 1219 children, viz. 567 boys and 574 girls, and 78 of sex not specified, were receiving daily instruction; and five Sunday schools, with 761 scholars, viz. 369 boys and 392 girls. One of these schools is a proprietary school; and another, called the King's School, is governed by the dean and chapter. An endowed mathematical free-school was established in 1701. Among the schools enumerated were two large national schools. There is an almshouse and dormitory for poor travellers in the town, where they receive entertainment and a night's lodging.

Rochester Diocese.—The diocese of Rochester is one of the smallest in the kingdom, and one of the most slenderly endowed. It contains but one archdeaconry, that of Rochester, divided into the three deaneries of Rochester, Dartford, and Malling, all in the western part of the county of Kent. The deanery of Shoreham, though nearly on every side enclosed within the diocese of Rochester, and frequently reckoned as a part of it, is in the peculiar jurisdiction of the archbishop of Canterbury. The number of parishes in the diocese (not including the deanery of Shoreham) is given by Hasted (*Hist. of Kent*, vol. ii., Canterbury, 1782) at ninety-nine: in Lewis's 'Topographical Dict.' it is given at ninety-one. We believe the latter account to be nearly correct as to the number of parishes, but the additions of dependent chapelries will swell the number to that given by Hasted, and by including ecclesiastical divisions lately formed, to a greater number still. The clear yearly revenue of the bishopric is estimated at 1459*l.* The gross yearly revenue of the cathedral is estimated at 7178*l.*; but the payment of stipends, the maintenance of the fabric, and the support of the grammar-school, cause a deduction of 2072*l.*; leaving 5106*l.* to be divided among the corporation, which consists of the dean and six prebendaries. (*Report of the Ecclesiastical Revenue Commissioners*, 1835.) There were formerly six minor canons, but now there are only three, who fill in succession the offices of sacrist and precentor, and a master and usher of the King's School.

It is recommended by the Church Commissioners to make great alterations in this diocese. They propose to transfer to the diocese of London those parishes of the deanery of Dartford which are nearest the metropolis; and to the diocese of Canterbury the remainder of the deanery of Dartford and the whole of that of Malling: these additions, with that of the deanery of Shoreham, will place nearly the whole of Kent under the see of Canterbury. In return it is proposed to add to Rochester nearly the whole of the archdeaconry of Essex (including the deaneries of Rochford, Dengey, Chelmsford, Barstaple, Chafford, Ongar, and part of Barking) and the whole of the archdeaconries of Middlesex (containing the deaneries of Hedningham, Dunmow, Harlow, and Braughing), Colchester (containing the deaneries of Tendering, Colchester, Lexden, Witham, Sampford, Newport, and the jurisdiction of Waltham), and Saint Alban's; all taken from the diocese of London; and the four deaneries of Baldock, Hitchin, Berkhampsted, and Hertford, in the archdeaconry of Huntingdon, taken from Lincoln. By these changes nearly the whole of Essex and the whole of Hertfordshire will be placed under the see of Rochester, which will retain only the deanery of Rochester of its more antient diocese.

The diocese of Rochester was founded A.D. 604. Justus, one of the companions of Augustin, the apostle of the Anglo-Saxons, was the first bishop; but on the relapse of Eadbald, king of Kent, into paganism, he fled to the Continent. On the reconversion of Eadbald, he returned. He was translated to Canterbury, A.D. 624. Gundulph, who was bishop from A.D. 1077 to 1107, rebuilt the cathedral: part of his building remains in the nave of the present edifice. Walter de Merton, who was bishop from A.D. 1274 to 1277, was chancellor of England and founder of Merton College, Oxford. John Fisher, bishop from A.D. 1504 to 1535, was beheaded by Henry VIII. for denying the king's supremacy, in the 80th year of his age. Thomas Sprat, bishop from A.D. 1684 to 1713, was a writer of considerable note; and his successor, Francis Atterbury (bishop from 1713 to 1723), is celebrated both as an eminent writer and a leading Jacobite. Zachary Pearce, bishop from A.D. 1756 to 1774, is well known as a commentator and critic.

ROCHESTER, LORD. [WILMOT.]

ROCHFORD. [ESSEX.]

ROCK ALUM. [ALUM.]

ROCK CRYSTAL [QUARTZ.]

ROCK MANAKIN. [RUPICOLINÆ.]

ROCK-PLANTS are those plants which are distinguished by growing on or among naked rocks, and are confined to no particular region or latitude. De Candolle (*Dictionnaire des Sciences Naturelles*, vol. xviii) observes that they pass by insensible gradations into the plants that inhabit walls, rocky and stony places, and even gravelly places, from which they pass into those that are found particularly on sands and barren soils. Most of the plants growing on rocks have but a small development of root, as they derive their nutriment principally from the air, through the medium of their leaves and stems. A large number of the Cryptogamia, especially mosses and lichens, belong to this class. Many of these plants present a remarkable diversity, according to the nature of the rocks on which they grow. This is a subject which has not received the attention that it deserves.

Rock-plants are often introduced into gardens for the purposes of ornament, for which the size and beauty of the flowers of many of them peculiarly adapt them. [ROCK-WORK.]

ROCK RIVER. [MISSISSIPPI, River.]

ROCK SALT. [SODIUM.]

ROCK-WORK, in gardening, an elevation, composed of earth and other loose materials, and covered with stones and fragments of rock, &c., amongst which plants adapted for such a situation are grown. When the rock-work is managed skilfully, and in accordance with surrounding objects, it may be made to add much to the beauty and interest of the garden. In the first place a proper situation should be selected, and the character of the rocks should harmonise with the situation. Simple outlines and surfaces not broken into fantastic shapes, are best suited to show off the plants; in this respect hints should be taken from the natural rock-work that often meets us by the mountain side. Cones and peaks of unnatural shape and size should be avoided. A ground-plan in the form of a crescent or of an irregular figure is best; the middle portions should be the broadest and most elevated. When large portions are thus laid out, steps may be formed leading to basins of water on the sides or summits of the rock-work. These basins of water have two advantages: first, in permitting the growth of various aquatic plants; and secondly, in keeping the great mass of earth in the rock-work moist and cool. The best stones for rock-work are those which resist the action of the air, and they may be selected according to convenience from the rocks of the neighbourhood in which they are used. The most irregular ought to be chosen, especially those with cavities in them, which may be filled with earth for the growth of mosses, ferns, and small plants. Frequently stones are met with covered with lichens, which, from their picturesque colours, have a pleasing effect. Of these, the *Lichen atroflavus, geographicus, ventosus, perellus*, and *stellaris*, are most common. Such stones are mostly large, and are best adapted for the base of the rock-work. Portions of ruins, antiquities, corals, petrefactions, idols, shells, and Chinese garden-ornaments are often introduced into rock-work, but they give too much of an artificial character to the work, and it is questionable whether they can ever be introduced among plants with good effect.

Although the rock-work is intended to present a mountainous or rocky vegetation in a small space, yet there are many circumstances that prevent the growth of true mountain and rock plants in such a situation; but the dry ridges of earth and stones of which it is composed afford a favourable situation for the plants that chiefly occupy the dry soil of plains. On this account, small shrubs and creeping plants of any kind that will grow in a dry soil are selected for rock-work. We shall here point out those which may with advantage be cultivated for this purpose.

The natural order Leguminosæ affords a great number of plants fitted for rock-work. The triangular Genista (*Genista triquetra*) is a trailing shrub, evergreen in winter. From its winged triangular green shoots it produces a vast profusion of flowers of a golden colour from April to July. Anxantic Genista (*Genista anxantica*) is a diffuse plant producing an abundance of yellow flowers from June to July. The dwarf Cytisus (*Cytisus nanus*) is a pretty procumbent shrub, flowering in July. It should be planted in a dry soil, which should be covered over with broad flat stones. The Rest-harrows (*Ononis*) are suffruticose plants, with purple and red flowers. Most of the woody Leguminosæ have yellow flowers; hence the Rest-harrows form an agreeable variety. *Astragalus altaicus, aristatus*, and *brevifolius*, are all suffruticose plants, the last with purple flowers, which would form good plants for rock-work. To these may be added *Hedysarum coronarium* and *pallidum; Astragalus tragacantha, campestris, hypoglottis*, and *uralensis*.

Almost all the Rock-rose tribe (Cistaceæ) may be grown with success on rock-work. The procumbent and Fumana Sun roses (*Helianthemum procumbens et fumana*) have both procumbent branches, small beak-like leaves, and yellow flowers, which appear in June and July. *H. Rodantha* has bright red flowers inclining to crimson. It is quite hardy, of easy culture, and produces its flowers in abundance.

Several of the hardier species of the natural order Mesembryaceæ will bear exposure; and as they require little nutriment and soil, are well adapted for growth on rock-work. Many of the species also of the order Crassulaceæ will grow under the same circumstances. Cotyledon umbilicus requires nothing more than a little sand. Several species of Stone-crop (*Sedum*), as *S. anglicum, Forsteri, glaucum, hybridum, rupestre, sexangulare*, and *villosum*, will flourish in very dry situations.

Many of the Cruciferous plants are naturally rock-plants. The common stock (*Matthiola incana*) and wall-flower (*Cheiranthus Cheiri*) are well known on walls and rocky situations. *Alyssum calycinum*, *montanum*, *murael*, *saxatile*, *Iberis Tenoredna*, *Cochlearia saxatilis*, *Aubrietia alpina*, *Arabis alpina*, *bellidifolia*, *petræa*, *Draba aizoides*, *Aizoon*, *stellata*, *tomentosa*, *Thlaspi alpestre*, &c., will all grow on rock-work, and many of them bloom all the summer round. The False Cytisus (*Vella pseudo-cytisus*) is a shrub with yellow petals and purple claws, which may be prettily associated with the dwarf furze and the Nitraria.

Of the Labiate plants, the species and varieties of the thyme claim the first place. They grow well amongst rocks, especially of a calcareous kind; and patches of the various species, especially *Thymus vulgaris* and *grandiflora*, should form a part of every rock-work. They are not only beautiful in flower, but are exceedingly fragrant, and are a source of attraction to bees. *Betonica alopecurus*, and *Ajuga alpina* and *pyramidalis* may be also cultivated.

Many of the species of the order Caryophylleæ may be grown. One of the most prolific of these is the *Cerastium repens*, which grows very rapidly, and is consequently adapted to cover parts that do not look well exposed. It is for this purpose often used to cover heaps of rubbish. Various species of Dianthus will grow well, and are very ornamental, as *D. deltoides*, *armeria*, *collinus*, *hyssopifolius*, *plumarius*, *virgineus*; also *Cerastium latifolium*, *alpinum*, *Silene atocion*, and *rubella*.

Many of the Saxifrages are true rock-plants: they mostly blossom early in the year. The following species may be grown amongst rocks:—*S. oppositifolia*, *paniculata*, *aizoides*, *nivalis*, *petræa*, *densa*, *retusa*, *elongella*.

Many of the Campanulas may be grown successfully. *C. carpatica*, *collina*, *alba*, and *saxatilis* blossom nearly all the summer: the latter is a very ornamental plant. Many other plants have been recommended for cultivation in rock-work: of these we shall add the names of a few that are deserving of attention on account of the continuance of their flowers during the greater part of the summer:—*Oxalis violacea*, *Rubus arcticus*, *Chamæmorus saxatilis*, *Illecebrum Puronychia*, *Linaria alpina*, *Epimedium alpinum*, *Arnica montana*, *Achillæa Clavenæ*.

ROCKET is a cylindrical vessel or case, of pasteboard or iron, attached to one end of a light rod of wood, and containing a composition which, being fired, the vessel and rod are projected through the air by a force arising from the combustion.

Rockets have long been used as a means of making signals for the purpose of communication when the parties have been invisible from distance or darkness, or otherwise inaccessible to each other; and they have occasionally served the important purpose of determining the difference of longitude between two places. In the latter case the rocket is fired at some convenient spot between the stations, from both of which the explosion must be visible; and the latter being instantaneous, the difference between the times at which it is observed, as indicated by chronometers regulated so as to show the mean times at the places, is the required difference of longitude. Rockets have also been constructed for the purpose of being used in warfare, and such missiles were so employed for the first time at the siege of Copenhagen in 1807.

In signal rockets the part of the case which contains the composition, by whose combustion the projectile force is produced, is joined, at the upper extremity, to a conical case containing the composition for producing the explosions or *stars* of light which constitute the signal, and the length of this part is always rather greater than the diameter of the cylindrical part of the case. Such rockets are made to weigh half a pound, one pound, or two pounds. The exterior diameter of the one-pound rocket is 1⅝ inch; the length of the cylindridal case is 12⅝ inches, and the length of the conical head is 3⅓ inches. The rod is generally attached near the base and on one side of the rocket; its length is about 8 feet, or 60 diameters of the rocket, and its thickness is about half a diameter of the latter. The composition with which the cylinder is filled consists generally of saltpetre, sulphur, and charcoal or gunpowder; the whole is reduced to a mealed state, and well mixed together in the following proportions:—saltpetre, 4 lbs. 4 oz.; sulphur, 12 oz.; and charcoal or mealed powder, 2 lbs. The composition which produces what are called the stars consists of saltpetre, 8 lbs.: sulphur, 2 lbs.; antimony, 2 lbs.; mealed powder, 8 oz.: and isinglass, 3¾ oz. The latter is dissolved in one quart of vinegar, after which one pint of spirit of wine is added, and then the mealed composition is mixed with the liquid till the whole becomes of the same consistency as a stiff paste.

The composition for burning is rammed or driven into the rocket-case; but in the interior and about the axis, a void space of a conical form is left in order that a considerable surface of the composition may be at once in a state of combustion; and, at the *choke* or neck of the rocket (the part to which the rod is attached), there are several apertures, by one of which the fire is communicated to the composition. The combustion of the latter immediately takes place on all the concave conical surface about the void space just mentioned.

In order to understand the cause of the rocket's motion, let it be observed, that if the composition were to be fired within a vessel or case closed on all sides (combustion being supposed to be possible in such circumstances), the pressure of the flame would be equal in every direction, and the case would either burst in pieces, or, if sufficiently strong, would remain at rest while all the composition was being consumed. Now, the case having apertures at the choke or lower extremity of the cylinder, the pressure which would have taken place against that extremity is in great part annihilated by the flame escaping into the atmosphere; consequently the pressure exerted against the opposite extremity, being no longer counteracted, impels the rocket forward or upwards. This force of impulse acts in a manner similar to that by which a gun recoils when the charge is fired; but, in the latter case, the fluid escaping almost instantly from the bore, the force of impulse on the bottom of the chamber ceases nearly as soon as it is generated, whereas, in a rocket, the composition continuing to burn during several seconds, the force of impulse becomes a force of pressure, which continues to act till the material is consumed. Hence it follows that a rocket ascends, or moves forward, with an accelerated motion till the resistance of the air becomes equal to the accelerative force; and when the composition is burnt out, the rocket falls to the ground.

The rod serves to guide the rocket in its flight: for the common centre of gravity of the rocket and rod being a little below the top of the latter (in the one-pound rocket it is 2 feet from the upper extremity of the rocket, or 7 feet from the lower extremity of the rod); if we suppose the rocket to be fired vertically upwards, and a vibration should take place about the said centre of gravity by any excess of pressure on one side arising from an irregularity in the burning of the composition, the resistance of the air against the long portion of the rod below that centre, like a force acting on the longer arm of a lever, will exceed the force by which the vibration is produced, since the latter force acts on the rocket and the upper part of the rod which constitutes the shorter arm of the lever; and thus the vibration is checked, or prevented, and the rocket is enabled to ascend steadily. But, in proportion as the composition burns out, the common centre of gravity approaches nearer the middle of the whole length of the rocket and rod: and the resistance of the air acting at length nearly equally above and below that centre, it can no longer counteract any inequality in the burning of the composition. Thus, in falling, the top of the rocket, or the rocket end of the rod, is downwards.

The rod performs a similar service when the rocket is impelled horizontally or obliquely; for, while the force of projection is great enough to carry the rocket forward, and the centre of gravity of the whole is near the rocket end of the rod, the resistance of the air against the tail of the latter will nearly prevent any vibration; but, when the centre of gravity has got near the middle of the length, the head of the rocket begins to droop, and at length the whole comes obliquely to the ground. It has happened however, from the rod being too short or too light, that the weight of the rocket, when the latter has been projected with a small elevation, has so much incurvated the line of its path before the composition has burnt out, that the rod has turned over it, and the whole has been driven to the ground in a direction tending towards the place from whence it was projected.

Rockets whose diameters vary from 1 to 2 inches, have been found to ascend vertically to the height of about 500 yards; and those whose diameters vary from 2 to 3 inches, have ascended to the height of 1200 yards. The distances at which rockets can be seen vary from 35 to 40 miles; and the times of ascent, from 7 to 10 seconds. (Robins's *Tracts*, vol. ii.)

Rockets, to be employed as military projectiles, were invented by Sir William Congreve, and, in the British artillery service, a body of men, called the rocket troop, has been organised expressly for their management. Sir William caused the rockets to be made with strong iron cases of cylindrical forms, and terminating at the head with a paraboloid or cone; and he attached the rod so that its axis should coincide in direction with that of the rocket. They serve either as shells or carcasses, and their weights are 3, 6, 12, 24, and 32 pounds. Military rockets are, in general, fired from tubes in order that the direction of their flight may be more certain; and the proper elevation, at least for the smaller rockets, is about one degree for each hundred yards in the required range. From their form they penetrate to a considerable depth when fired against timber or earth: 12 pounder rockets, after a range of 1260 yards, have been found to enter the ground obliquely as far as 22 feet. The icipal inconvenience attending the rocket practice is the owerful action of the wind when it blows in a direction pendicular, and even oblique, to the intended line of t.

ckets, being much lighter than any other kind of ordnance, and capable of being used with or without carriages, well adapted for conveyance in mountainous countries. fired in volleys against troops, their effect is likely to [illegible] much disorder; and those which act as carcasses, n fired against buildings, will almost certainly cause destruction. Besides being employed in the siege of ubagen, rockets were used at the bombardment of hing (1809); and in 1813 the British rocket-troop ren[illegible] considerable service at the battle of Leipzig. The ance of a French column against an inferior force of h troops was checked by a well directed fire of rockets [illegible] passage of the Adour in the last-mentioned year; nd it is said that the explosion of the powder-magazine which lately (1840) produced such disastrous effects at Acre, was caused by the fall of a rocket on the building.

ROCKINGHAM. [NORTHAMPTONSHIRE.]

ROC[illegible]NGHAM, CHARLES WATSON WENT-[illegible], MARQUESS OF, was the only son of the first rquess of Rockingham, and was born 13th May, 1730, wo years after the title of Baron of Malton had been conferred upon his father, who, in 1734, was advanced to the ity of Earl of Malton, and, having succeeded to his [illegible] in the barony of Rockingham in 1746, was created [illegible] of Rockingham the same year. The Watsons, [illegible] and for some time earls of Rockingham, had ori-lly acquired importance by the marriage of one of them [illegible] the sister of the great earl of Strafford, whose vast tes they in this way came to inherit.

ptember, 1750, while his father was still alive, the [illegible] of the present article was created earl of Malton in rish peerage; but before the end of the year his [illegible] death left him in possession of the marquesate. Young as he was when he thus entered the House of Lords, e did not wait long before beginning to take a share in debate. Horace Walpole, in his 'Memoirs of the Last Ten Years of the Reign of George II.,' notices one or two of his [illegible] appearances in not very complimentary terms. what was called the Scotch Bill (for planting colonies [illegible] Protestants on the forfeited estates in Scotland) [illegible] discussion in March, 1752, he says, 'The young quess of Rockingham entered into a debate so much re his force, and partly applied the trite old apologue of nius Agrippa, and the sillier old story of the fellow of [illegible] who asked why we should do anything for pos-[illegible] had never done anything for us!' Again, in his ount of the debates in the following February, about the rge of Jacobitism brought against the solicitor-general (Lord Mansfield) and other persons connected with rt, he notes, in the same sarcastic style:—'Lord umberland, perceiving it was a day for great men to h, thought it a good opportunity to announce his [illegible]ity; but he said little to the purpose. Still less [illegible] by the young marquess of Rockingham, though he prepared a long quotation from Tacitus about infor-[illegible] and opened with it.'

although never rated high as a man of talent, the wealth and independent position of the marquess ne-y secured him great influence, which was much hened by his upright and honourable character in [illegible] as well as by the moderation and c[illegible] con[illegible]ct, al[illegible]ugh [illegible]

of notions he had originally taken up. He had been educated in the principles of what was then considered constitutional Whiggism, and he evidently to the end of his life never entertained a doubt about the truth of his political opinions. In February, 1760, he was made a Knight of the Garter. His political career from this date forms part of the history of the next reign, and of the several persons of much greater mark than himself with whom he was brought into association or collision in the fluctuating contest of parties. [GEORGE III.; BURKE; PITT.] He was first lord of the treasury and prime minister from 10th July, 1765, to 12th July, 1766, and was again placed at the head of affairs with the same office on the resignation of Lord North, in March, 1782, but died the 1st of July of that year. The marquess of Rockingham married, in 1752, the daughter of Thomas Bright, Esq., of Badsworth, but had no children. His eldest sister was married in 1744 to the first Earl Fitzwilliam, whose son, having succeeded to the family estate on the death of the marquess, took the surname of Wentworth in 1807.

ROCKS. A knowledge of the various earthy and metallic substances which compose the parts of the globe near the surface, seems indispensable to the geologist, whose reasonings on the origin and changes of these substances form no inconsiderable portion of the science which he is cultivating. It is therefore with some surprise and disappointment that a student of geology finds the classifications of rocks used in works of reputation formed with no harmony in detail, and little agreement in principle. In many works on mineralogy, compound rocks, as basalt, are classed among simple minerals; and a place is assigned even to clays and slates. On the other hand geologists have not hesitated to employ names originally designed to express particular mineral constitution, in a vague and general sense as regards the *nature* of the rock, though strict and definite as relating to its *age*. Such writers, in fact, do not by the name which they use, as 'gneiss,' or 'grauwacke,' or 'trap,' mean, or wish to express, *what* the rock is which they thus designate, but *where* is its place on the scale of stratified rocks, or *how* its mineral aggregation is related to particular circumstances of melting or cooling. That this latter method, if carried to extrems, would be subversive of accurate notions concerning the origin of rocks, is not only probable on general grounds, but has been amply proved by experience. The terms 'gneiss,' 'grauwacke,' clayslate, &c., as given by Werner, or adopted by his followers, had a mineralogical meaning; but each of these terms has been freely employed by modern geologists to include a great variety of rocks but slightly related to, or even merely associated with, the typical compound signified. When we are told that 'there is no gneiss in Cornwall,' the assertion is true, or nearly so, even in a Wernerian sense; but it is equally true that some part of the vast and various rocks of Scotland, combined in the 'gneiss' of MacCulloch, may as well be ranked with clayslate as much of the killas of Cornwall, and that other members of this gneiss series might be called mica slate, hornblende slate, or quartz rock. (See MacCulloch *On Rocks*.) To avoid this confusion of mineralogical and geological meanings in one term, several able attempts have been made upon one of the following plain principles:—

1. To assign to a series of rocks in which several mineral types (as sandstone, limestone, argillaceous beds) occur, and which therefore cannot be well described by a mineralogical term, a name depending on locality. Hence 'the Silurian system,' 'the Devonian system,' &c.

2. To give to such a series a title derived from its most characteristic member; as the 'Cretaceous group,' the 'Oolitic system,' the 'New Red-Sandstone series,' the 'Granitic formation.'

3. To avoid all such specially characteristic names, and to substitute terms expressive merely of relative place in the supposed or established series of geological events. Hence Mr. Conybeare's method of superior, supramedial, medial, submedial, and inferior orders of strata. It is perhaps to be wondered at that this simple and expressive method has neither been fully developed nor followed.

4. A view almost equivalent in practice, and founded [illegible]ly on the same basis, but distinctly involving an im-[illegible]ant inference regarding the lapse of time, gives us such [illegible] as Prim[illegible] strata, Transition rocks, Secondary series, [illegible] fo[illegible]ons; and, as a subdivision of these latter, [illegible], Pleiocene deposits. It is somewhat [illegible]le the use of Transition rocks is pro-

scribed as too hypothetical (it merely involves an inference seldom disputed), the equally hypothetical titles of Eocene, Meiocene, and Pleiocene deposits, should be freely admitted even by those who think Lower, Middle, and Upper less objectionable in this particular instance, and more useful and applicable in regard to all the older stratified deposits. Brongniart classes rocks under the Saturnian (antient) and Jovian (actual or modern) periods. (*Tableau des Terrains.*)

Systematic views of rocks, considered as mineral aggregates without any reference to their geological history, have been seldom completed. M. Brongniart has presented a classification of 'mixed rocks' nearly conformed to this principle, which has been of service. Dr. MacCulloch's 'Treatise on Rocks' is a mixed method, mineralogical in detail, geological in the large features. This writer gives the following list of

'Minerals which enter into the composition of rocks:'—

Indurated clay, from the softest substances found in trap to jasper and silicious schist.
Clinkstone.
Compact felspar, including the hornstone and petrosilex of some writers.
Common and glassy felspar.
Quartz.
Carbonate of lime.
Mica.
Chlorite (foliated).
Talc.
Hornblende.
Actinolite.
Augite.
Hypersthene.
Diallage.
Tourmaline.
Serpentine.
Steatite.
Noble Serpentine.
Gypsum.
Iron, in various states of oxidation, and combined with carbonic acid, water, &c.
Bitumen.
Pitchstone.
Chert.

He then adds a list of minerals occasionally imbedded in rocks, so to modify their aspect, viz.:—

Garnet.
Olivine.
Cyanite.
Pinite.
Spodumene.
Chiastolite.
Staurotide
Epidote.
Mesotype.
Zircon.
Topaz.
Beryl.
Chrysoberyl.
Fluor Spar.
Corundum.
Oxydulous Iron.
Pyrites.
Chromate of Iron.
Prehnite.
Andalusite.
Apatite.
Sphene.
Oxyde of Tin.
Molybdena.

He then names the rocks in which the minerals of the first class occur. We extract the most important of these notices:—

Indurated clay occurs in claystone not schistose, some porphyries and amygdaloids, some basalts; also in argillaceous schist, shale, limestone.

Compact felspar occurs as a simple rock; also in gneiss, porphyries, amygdaloids, syenites, greenstones, augite rocks, hypersthene rocks, granite.

Quartz occurs in quartz rock, granite, gneiss, mica schist, chlorite schist, talcose schist, argillaceous schist, sandstone, porphyries, syenites, and greenstones.

Felspar occurs in granite, gneiss, chlorite schist, hornblende schist, actinolite schist, sandstone, quartz rock, greenstone, porphyry, syenite, pitchstone.

Mica occurs in granite, gneiss, mica schist, quartz rock, sandstone, shale, limestone, claystone, syenite, porphyry.

Chlorite occurs in chlorite schist, granite, gneiss, actinolite schist, argillaceous schist.

Talc occurs in talcose schist, primary limestone, granite, serpentine.

Hornblende occurs in granite, gneiss, hornblende schist, micaceous schist, argillaceous schist, primary limestone, serpentine, syenite, greenstone, basalt, porphyry, chloritic schist, actinolite schist.

M. Brongniart's general view of mixed rocks may be put in the following abbreviated form:—

A. Crystallized isomerous rocks (the parts equally mixed).

1. Felspathic rocks.
   - *a.* Granite. Laminated felspar, quartz, and mica, equally disseminated.
   - *b.* Protogine. Felspar, quartz, steatite, or talc, or chlorite.
   - *c.* Pegmatite (graphic granite). Laminated felspar, and quartz.
   - *d.* Mimose. Laminated felspar, and augite.
2. Hornblendic rocks.
   - *a.* Syenite. Laminated felspar, hornblende, and
   - *b.* Diallage. Hornblende, and compact felspar d nated.
   - *c.* Hemithrene. Hornblende and limestone.

B. Crystallized Anisomerous Rocks (the parts un mixed).

1. Base of quartz.
   - *a.* Hyalomicte. Crystallized quartz, and dissem mica.
2. Base of mica.
   - *a.* Gneiss. Mica abundant in plates, lamellar or lar felspar—a laminated rock.
   - *b.* Mica schist. Continuous mica and quartz.
3. Base of schist.
   - *a.* Phyllade. Clay slate containing various min
   - *b.* Calcischist. Argillaceous schist and lim variously mixed.
4. Base of talc.
   - *a.* Steaschist. Talcose base with disseminated mi
5. Base of serpentine.
   - *a.* Ophiolite. Serpentine, including various mi as chromate and oxide of iron, diallage, garnet
6. Base of limestone.
   - Cipolin. Granular limestone with mica.
   - *b.* Ophicalce. Limestone, with serpentine, talc, o rite, imbedded.
   - *c.* Calciphyre. Limestone enveloping crystals, spar, garnet, hornblende, &c.
7. Base of cornean (compact felspar of MacCulloch
   - *a.* Variolite. Including nodules and veins of v kinds.
   - *b.* Vakite. Including mica, augite, &c.
8. Base of hornblende or basalt.
   - *a.* Amphibolite. Base of hornblende, with di nated minerals.
   - *b.* Basanite. Base of compact basalt, with di nated minerals.
   - *c.* Trappite. Base of hard compact dull cornea with mica, felspar, &c.
   - *d.* Melaphyre (Trap porphyry). Black petrosil hornblende, with crystals of felspar.
9. Base of petrosilex, coloured by hornblende.
   - *a.* Porphyry. Paste of reddish petrosilex, with c of felspar.
   - *b.* Ophite. Paste of green petrosilex, with cryst felspar.
   - *c.* Amygdaloid. Paste of petrosilex, with nodu petrosilex of a different colour.
   - *d.* Euphotide. Enclosing crystals of diallage.
10. Base of petrosilex or compact felspar.
    - *a.* Eurite. With mica, &c. disseminated.
    - *b.* Leptenite. Base of granular felspar, with mic quartz.
    - *c.* Trachyte. With crystals of glassy felspar.
11. Base of claystone.
    - *a.* Clay porphyry. Crystals of felspar.
    - *b.* Domite. Crystals of mica.
12. Base of pitchstone.

Stigmite. With crystals of felspar (commonly porphyritic pitchstone).

13. Base undetermined.
    - Lava.

C. Aggregated rocks (uncrystallized; the parts irreg mixed).

1. Cemented rocks.
   - *a.* Psammite. Grains of quartz, &c. united. (This includes sandstones, grauwacke, &c.)
2. Imbedded rocks.
   - *a.* Mimophyre. Cement argillaceous, uniting di grains of felspar, &c.
   - *b.* Psefite. Cement argillaceous, including frag of mica schist, slate, &c.
   - *c.* Pudding-stone. Cement including large rou pieces of different kinds in different varieties of ding-stone, as quartz, limestone, flints.
   - *d.* Breccia. The fragments angular.

The most prevalent classification of rocks in actual founded on one leading feature of their origin and hi Rocks are of igneous origin (pyrogenous rocks), or of aq origin (hydrogenous rocks), and thus make two great cla the former being often considered, with reference t

of their occurrence in two divisions, viz. hy-
utonic rocks (as granite), and volcanic rocks
): the latter being distinguished into fresh-
deposits, the result of chemical, vital, and
ncies exerted in water. Many cases are
tion of these hydrogenous rocks by con-
Plutonic or volcanic masses: by this change they
he name of metamorphic rocks. These clays and
es are hardened, and have their structure altered
resemble clay slate, quartz rock, or jasper; and
li stone are rendered crystalline.

as the best and most applicable the fundamental
of pyrogenous and hydrogenous rocks, the
will find by experience that the best if not the only
y of describing and recognising rocks, is by atten-
their elementary composition. The granitic, por-
amygdaloidal, or other structures of igneous rocks,
any variable circumstances due to particular acci-
the fusion or cooling of the masses, and belong
ess to all of them, as the compact, oolitic, arenaceous,
er characteristic textures of hydrogenous rocks
culiarities of their aggregation or solidification.

crope has successfully shown, in his 'Synopsis of
Rocks' (*Journal of Science*, vol. xxi.), that these
ompounds may be easily and philosophically classed
deration of the relative abundance of two minerals,
bsent from any of them, viz. felspar and augite.
spar is sometimes replaced by leucite, haüyne,
r mellite; the augite by hornblende or titaniferous
Hence we have only three great groups:—

Felspathic ....Trachyte.
Augito-felspathic..Graystone.
Augitic ....Basalt.

h of these belong many varieties, and many grada-
ranitic, porphyritic, amygdaloidal, and other struc-
AVA.] By a similar method we may class the older
ic rocks of fusion, as: Felspathic,—granite, porphy-
rock, claystone, eurite, pitchstone; Augito-fel-
ienite, euphotide; Augitic,—sienite, hypersthene
enstone, basalt, wacké, melaphyre.

ydrogenous rocks of most importance may be
ccording to their arenaceous, argillaceous, calcare-
ther basis, as—

eous, uniform, as sandstones, sands; aggregated as
rates, pudding-stones.
aceous, uniform, as clay and shale; containing
as some clay conglomerates.
-calcareous, as marls properly so called.
eous, as chalk, limestone.
eo-magnesian, as dolomite.
, as gypsum, rock salt.
aceous, as coal, lignite.
ginous, as ironstone.
erous, as the kupferschiefer.

y. all these hydrogenous rocks are liable to local
by contact or proximity with the rocks of fusion.
etamorphic rocks may be classed according to the
m as those which are unaltered. We give below
c examples of several cases of metamorphism:—

aceous rocks, metamorphic by *induration*, as along
e dykes in Arran, and Salisbury Crags. Similar
appen beneath iron-furnaces, and when the effect is
the result is *quartz rock*.

laceous rocks, metamorphic by *induration*, and a
onfluence of grains. In extreme cases the result
of clay slate, or hone slate, or Lydian stone, with
ites, and rarely *garnets*, embedded. An example of
r occurs at Plas Newydd.

careous rocks, metamorphic by re-arrangement of
. Thus granular or saccharoid limestone is found
of the basaltic dykes in Antrim, on the green-
esdale, near the hypersthene of Sky, &c. The
primary strata is of similar appearance,
contact with igneous rocks.

onaceous. Coal becomes coke or anthracite near
kes.

s of this kind have shown that ordinary
rocks altered by heat acquire aspects and struc-
ositions resembling almost exactly those
among the earliest or primary strata, as
clay slate, garnet mica slate, garnet gneiss,
, &c.; and it is therefore a probable infer-
such cases of strict resemblance those ancient rocks have undergone on a great scale, and under the general influence of the intense heat of the earth, the changes which are certainly proved to have happened locally, from limited agencies, on substances of similar chemical quality. Very careful investigations on these points are however still needed to fix limits and give precision and certainty to the inferences from phenomena.

The circumstances which accompany the appearance of pyrogenous rocks will often lead us to probable views as to the conditions under which they were fused and cooled. Thus from the granite masses of Arran and Cornwall, very coarse in their granulation, veins proceed into the adjoining slate rocks, and become more and more fine in grain, and porphyritic or merely felspathic in aspect; the coarse greenstone of Salisbury Crags acquires compactness where it touches the sandstone rocks; in a modern furnace the centre of masses of fused rock or melted metal is usually the most porous part; and all these facts are linked together in the more general proposition, that slow cooling allows of large and regular, while rapid refrigeration generally forces a minute, hasty, and confused structure, in which crystallization is sometimes quite destroyed. [See Basalt for some notice of Mr. Gregory Watt's experiments on this substance cooled from fusion.]

Considerations of this kind explain the generally greater compactness of Plutonic, as compared with the cellularity of volcanic rocks, and indeed there is little other difference between them than that which is intelligible as a consequence of the outpouring of one class at or near the surface and under air, and the solidification of the other under great depths of water, as some greenstones; inclosed in masses of preconsolidated rock, as some porphyries; or slowly cooled in enormous quantity, as granite, and hypersthenic sienite.

Similarly, by attention to the texture and structure of the rocks deposited by water, we find marks of sedimentary accumulation in sandstones and clays, and proofs of chemical precipitation or vital arrangement in limestones. We may put some of the results on this subject in a very simple series, which can hardly fail to suggest important reflections.

Littoral and Flood Deposits, as conglomerates and sandstones: the latter showing often ripple-mark, sometimes impressions of littoral or terrestrial animals; the former, a confused aggregation resulting from local agitation.

Sea and River Sediments.—Shales and clays, often finely and regularly laminated, and of very uniform composition, the fruit of more tranquil deposition in deeper or calmer water.

Pelagian Deposits, as some limestone strata, the accumulation of dead shells, crinoidea, foraminifera, &c., and others which are in part the preserved structures of coral. Thus some beds of marble are really masses of crinoidea, others of coral, some of shells, some chalk is full of spiculæ of sponges, &c., and other calcareous beds are replete with foraminifera.

[Basalt; Granite; Grauwacke; Gneiss; Lava; Mica Schist; Porphyry; Stratification.]

ROCROY, a fortified town in France, capital of an arrondissement in the department of Ardennes, 161 miles north-east of Paris by Soissons, Reims, and Mézières. Rocroy, then a village, was fortified by François I., A.D. 1537, to defend the frontier on that side: the fortifications were finished, and the place raised to the rank of a town, by his son Henri II. It was besieged, A.D. 1643, by the Spaniards under Don Francisco de Melos, who occupied a very strong position, covered by marshes and woods, and accessible only by a single causeway. The French under the duke of Enghien, afterwards better known as prince of Condé (*Le Grand Condé*), then only twenty-two years of age, advanced against the Spaniards, and obtained a splendid and decisive victory (19th May), which laid the foundation of his military renown. The town stands in an extensive plain, about five miles from the left bank of the Meuse. The fortifications are of no great importance at present, though it still ranks as a fortress. The population in 1831 was 3623: the townsmen make tin ware and carpenters' tools. There are four fairs in the year. The town has a society of agriculture, a military hospital, and some government offices.

The arrondissement comprehends sixty-eight communes, and is divided into five cantons or districts, each under a justice of the peace. The population in 1831 was 43,807.

ROCKY MOUNTAINS is a term usually applied to an extensive mountain-system in North America, but as this term has too general a signification, and therefore cannot with propriety be applied to a particular system, geographers call the North American range the *Chippewyan Mountains*. These mountains occupy the central parts of that continent, but, like the Andes in South America, they are much nearer to the Pacific than to the Atlantic Ocean. The Chippewyan Mountains are far less known than the Andes in South America. Perhaps more than one-half of the eastern declivity has been seen by travellers, who have given some account of it, but, with the exception of a comparatively small part, the whole of the western declivity is almost entirely unknown.

It was formerly supposed that this mountain-system was only a continuation of the Andes of South America, and that these two mountain-regions were connected by a chain which traversed the Mexican Isthmus in its whole length. But it is now ascertained beyond doubt that a flat country of considerable extent intervenes between the Andes and the mountains of the Isthmus. [PANAMA.] It is also ascertained that the mountain-range which is known under the name of the Sierra Madre, in the northern of the Mexican States, is not connected with any of the southern offsets of the Chippewyan Mountains, but terminates about 150 miles south of the Sierra de Mogollon, or that branch of the Chippewyan Mountains which approaches nearest to it.

This mountain-system may be divided into three parts—the Southern, Central, and Northern Chippewyan Mountains. The first extends from 29° to 42° N. lat.; the Central Chippewyans from 42° to 49° N. lat.; and the Northern from 49° to nearly 70° N. lat. The whole length, from 29° to 70° N. lat., exceeds 3000 miles, and when the ridges, which probably traverse the north-western peninsula of North America from east to west, and apparently are only offsets of the great mountain range, are included, the whole length is about 4000 miles.

The *Southern Chippewyans* resemble the Northern Andes in being divided into three long ranges, which run off in diverging lines. The point from which they diverge is a mountain-knot, about 42° N. lat., and is called Sierra Verde. From this point the three ranges run southward. The most eastern range forms one elevated mass of rocks between 42° and 34° N. lat., and within these limits preserves the name of Chippewyan or Rocky Mountains. It runs nearly due south between 104° and 106° W. long. Between 35° and 34° N. lat. it divides into two ranges, both of which run southward and parallel to one another, including the narrow valley of the Rio Puerco, and terminate in the great bend of the Rio del Norte, between 29° and 30° N. lat. In the present state of geographical knowledge, these two ranges, which are called the Sierra de los Comanches, must be considered as the most southern extremity of the Chippewyan Mountains. It is hardly known on what authority these two ranges have been laid down on our maps, as the valley of the Rio Puerco and the countries east of it are in possession of the savage and warlike tribe of the Comanches, who do not allow strangers to enter their country. Only the western declivity of the western range has been seen by travellers, who describe the range as rising only to a moderate elevation, but having a very desolate and barren aspect, and being almost entirely without water and wood.

That part of the Southern Chippewyans which extends from 34° to 42° N. lat. is perhaps the best known part of the whole system, the eastern declivity having been examined for a considerable extent by Major Long. He says that the breadth varies from 50 to 100 miles. The mountains rise abruptly from the plains to the east of them, towering into peaks of great height, which are visible at the distance of more than 100 miles east of their base. They consist of ridges, knobs, and peaks variously disposed, among which there are many wide and fertile valleys. The more elevated parts of the mountains are covered with perpetual snow, which gives them a luminous, and at a great distance even a brilliant appearance, whence they have derived the name of the 'shining mountains.' The height of the James Peak has been ascertained to be about 8500 feet above its base, which is considered as between 2000 and 3000 feet above the sea-level. Though considered the highest summit in this part of the range, Major Long says, that judging from the position of the snow near the summit of other peaks and ridges at no great distance from it, it is apparent that they are much higher. The western declivity of this range is not so steep as the eastern, and does not descend so deep, the upper valley of the Rio del Norte being considerably more elevated than the plains east of the mountains.

The central range of the Southern Chippewyans runs nearly parallel to the eastern along the meridian of 107° W. long., and terminates near 34° N. lat. with the Sierra de Mogollon, a name which is sometimes applied to the whole range, though others called it Sierra de los Mimbres. It appears not to attain the elevation of the eastern range. On the eastern side its slope is well defined, as no offsets branch off from it, but the width and the western declivities are not known. It was formerly supposed that the Sierra de Mogollon was united by a mountain-chain to the Sierra Madre in Mexico; but the last-mentioned range terminates near 32° N. lat., and a level plain about 150 miles in extent intervenes between the two ranges.

The western chain of the Sout [illegible] the Sierra de los Guacaros, and [illegible] principal chain at the Sierra Verde. [illegible] tion of a mountain tract, which [illegible] and 112° W. long., and is prop [illegible] this range is unknown in its [illegible] le [illegible] known whether this ra [illegible] capped summit of the [illegible] 34° N. lat. and 117° [illegible] should be found to extend [illegible] een summit and the Sierra de los Guac [illegible] bable, the mountainous and ro [illegible] would constitute the most sc [illegible] pewyan Mountains.

As the countries surrounding the [illegible] are almost entirely inhabited by sav [illegible] to have no intercourse with one anot [illegible] known, with the exception of one o [illegible] near 36° N. lat., which is used by [illegible] caravans, which start from the town of [illegible] state of Missouri, for the town of Santa Fé [illegible] whence they proceed to Chihuahua. [illegible] mountain-pass does not appear to be [illegible]

The *Central Chippewyans* betwe [illegible] (42° N. lat.) and 49° N. lat. have b [illegible] American travellers, in passing fr [illegible] the river Colombia. In this part th [illegible] to contain two ranges of great ele [illegible] n. to one another at the distance of [illegible] high valleys, which are generally [illegible] masses, which protrude from the great cha [illegible] able distance within the valleys. The two [illegible] do not subside either on the east or on the [illegible] being separated from the level ground, [illegible] a great distance from them, by hilly [illegible] extent.

Not far from the Sierra Verde, towards the [illegible] the Spanish River, supposed to be the Rio [illegible] falls into the most northern recess of the G [illegible] nia, and the Big Horn River, an affluent of the [illegible] eastern chain of the mountains cont [illegible] depression, which presents an easy pass [illegible] so easy indeed that it [illegible] be crossed [illegible] these parts there is a [illegible] which is about ten miles in [illegible] of which is encrusted with [illegible] to a [illegible] of twelve or eight [illegible] incl [illegible] of th [illegible] mountains rise [illegible]; but [illegible] a range of un [illegible] elevation; they [illegible] groups, here and [illegible] re overtopped [illegible] which there is one which probably [illegible] 15 [illegible] above the [illegible] el of the sea. The eastern [illegible] longit [illegible] by [illegible] narrow [illegible] and rapid [illegible] of gra [illegible] and [illegible] bleak and bare. [illegible] of v [illegible] ation, but [illegible] y of the i [illegible] are cloth [illegible] with scrub pin [illegible] r, and [illegible] some places these [illegible] Some of the interior [illegible] eys are s [illegible] wi [illegible] broken stones, evidently of volcanic [illegible] extinct craters are seen on the highes [illegible]

Farther north, between 45° and 47° [illegible] appears to [illegible] intain a more equal ele [illegible] great h [illegible] Th [illegible] est [illegible] covered [illegible] in the [illegible] of [illegible] and [illegible] er, and in [illegible] parts, alo [illegible] not disappear till the month of June. The mean elevation of this range may be between 8000 and 9000 feet. This chain probably does not exceed 30 or 40 miles in width. The western chain, which is somewhat lower, appears to be of greater width. The middle of this range, which is called the Blue Mountains towards its northern extremity, is in some parts covered with dense and gloomy forests, and cut up by deep and precipitous ravines; but along its western side there is a hilly region, in which several wide depressions occur, most of which are well watered, and are prairie lands. Clarke River, one of the upper branches of the Columbia runs through a narrow valley, which at the place where it opens on the Columbia River expands into a plain about 60 miles in circumference, which has a good soil. In this part of the Chippewyan Mountains two easy passes are found between 46° and 47°, or between the upper branches of the Missouri and Clarke River; and it is stated, that they could be rendered fit for carriages without much labour. It is supposed that the base on which this part of the mountain system rests is between 4000 and 5000 feet above the sea-level.

But the approach to these passes is not easy, as the greatest part of the country immediately east of the mountains is covered with high and very rugged hills. The outer edge of this extensive mountain-region seems to be formed by a range of high hills, called the Black Hills, which at its southern extremity, on the north bank of the southern fork of the Platte River or Nebraska, is about 100 miles from the principal chains of the Chippewyan Mountains, but as it proceeds northward, diverges from their direction. The last-named ranges run north-north-west, whilst the Black Hills, beginning at the southern fork of the Nebraska, stretch thence in a north-east direction, and terminate in the great bend of the river Missouri, enclosing the valley of the Little Missouri on both sides. Thus the Black Hills near 46° N. lat. are more than 400 miles from the eastern chain of the Chippewyans. The connecting link between these two chains is formed by the Big Horn Mountains, which consist of two ridges that extend along both sides of Big Horn River to the place where that river joins the Yellow Stone River. The eastern of these two ridges seems to join the Black Hills south of 45°, near the sources of the Little Missouri. The Big Horn Mountains are described as a very rugged region of hills and rocky masses, of moderate height, but rising very steep. Their surface is diversified by numerous glens, in which clumps of pine-trees occur, and a profusion of grass and different plants. The Black Hills rise to a considerable elevation. In some parts they are covered with loose stones, and intersected by deep valleys, especially towards their northern extremity, but farther south they consist mostly of bare rocks, and there is little vegetation on their declivities. The country west of the Black Hills and south of the Big Horn Mountains is generally level or undulating. It is destitute of trees, but in most places covered with coarse grass, on which the buffaloes find abundant pasture. The extensive country which lies between the Black Hills and north of the Big Horn Mountains is entirely covered with ridges of hills rising to a moderate elevation, but presenting a great variety of shapes, like the ruins of old castles, domes, peaks, &c. In this region originate the numerous rivers by whose confluence the river Missouri is formed, besides its first great confluent the Yellow Stone River, which receives the waters of the Big Horn River. The great velocity with which the Missouri flows all through its course, and the numerous falls on its upper branches, favour the supposition that the base of this hilly region is at least 5000 feet above the sea-level. This supposition is also confirmed by the severity of the climate. Night-frosts occur in the higher parts of the narrow valleys in the month of August. As none of the numerous peaks which are dispersed over this region are covered with snow all the year round, it appears that the elevation of the summits above their base can hardly exceed 2000 feet.

The first attempts of the North Americans to pass to the west of the Chippewyan mountains were made along the course of the Missouri river by Lewis and Clarke, and they traversed the rugged hilly region which we have just noticed. Though, according to their report, the mountain-passes in these parts are of very easy access, and of such a description that even carts might pass them without great inconvenience, they found extensive tracts covered with snow in the month of June, and besides the great length of this road, it was tedious, fatiguing, and not exempt from danger. Later travellers have taken a shorter, and, to all appearance, a more convenient road. They ascend the Missouri to the vicinity of 45° N. lat., then pass by a due west route to the Black Hills, which they traverse near the sources of the Little Missouri, and south of the place where this range is connected with the Big Horn Mountains. They then travel along the south-eastern declivity of the last mentioned range to its junction with the Chippewyan Mountains, where they pass by the wide depression above noticed to the upper branches of Lewis River.

The hilly region which lies west of the Chippewyan mountains is far more extensive. In fact it occupies the whole country which lies between the western of the two principal ranges and the shores of the Pacific. In some places indeed there are plains of considerable extent, but they are surrounded by ranges of hills, and their surface is generally undulating. The general declivity of the surface is also far from being gentle, as the rivers which drain this region are interrupted by rapids and cataracts. In some places the rapids are 30, 40, and even 60 miles long, and of course render nearly the whole course of the rivers unfit for navigation. Among the higher ranges which traverse this region, that should be noticed which begins at Cape Mendocino on the Pacific, and is supposed to extend eastward, and to join the principal range of the Chippewyans near the Sierra Verde. It is not known whether a continuous mountain-range exists in these parts, but from the fact that these districts contain the watershed between the rivers which fall into the lower course of the Columbia River and those which run to the S. Francisco or Buenaventura, the existence of such a range is inferred. It seems very probable that another range, which extends along the Pacific from 100 to 150 miles from the shore, and terminates on the banks of the Columbia River opposite the Long Narrows, is immediately connected with the mountains near Cape Mendocino. This last-mentioned range, which is pretty well known in the vicinity of the Columbia River, contains some summits which rise above the snow-line. Mount Hood, about 50 miles south of the cataracts and rapids called the Long Narrows, attains the elevation of 15,900 feet above the sea.

The *Northern Chippewyans* extend from 49° N. lat. to the mouth of the river Mackenzie, a distance of more than 1500 miles. Their direction is nearly due north-west. The southern portion, between 49° and 55° N. lat. seems to be the highest part of the whole range. Most of the summits are covered with snow all the year round. Two of them have been measured. Mount Hooper is 15,690 feet, and Mount Brown nearly 16,000 feet high. These two summits are between 52° and 53° N. lat. On their eastern declivities rise the northern fork of the Saskatchevan and the river Athabasca, and from the western descend the rivers that form the two principal branches of the Columbia River. These two branches flow northward and southward in a deep and narrow valley which extends above 300 miles along the western base of the mountains. To the west of this valley rises the western chain of the Chippewyan Mountains: it is very little known, except as to its general direction and its elevation, which is much inferior to that of the eastern range. There are two mountain-passes over this portion of the Chippewyans which are used. The more southern is near 52° 30′ N. lat., probably along the southern declivity of Mount Hooper. It leads from the head of the northern branch of the Saskatchevan, by a short portage to one of the affluents of the Columbia, which enters that river near the place where its two upper branches, running in opposite directions, meet one another. The northern mountain-road occurs near 53° 30′ N. lat., between the Red Deer River, a branch of the Athabasca, and the northern branch of the Columbia River. It appears that these two passes are only practicable from the end of June to the middle of September, when they are crossed by the agents of the Hudson's Bay Company who bring the furs collected in the countries west of the Chippewyan Mountains to their establishments on the east of that range. The country along the eastern base of this part of the Chippewyans is a level, which has a dry sandy soil towards the south, with a scanty vegetation of coarse grass, but farther north it is covered with woods, and in many places is swampy. The tracts which skirt the foot of the range seem to be about 2000 feet above the sea-level.

Farther north, between 56° and 57° N. lat., the Chippewyans were traversed by Mackenzie, who followed the course of the

Peace River. This river breaks through the eastern range of the mountains, its upper course being in a valley between the two principal ranges, which appear to be here of nearly equal height. Both of them contain summits which are always covered with snow. Their height above the sea-level however seems to fall short of 4000 feet. Their elevation above the flat country east of the range does not exceed 1500 feet, and their base is hardly more than 2000 feet above the sea. The western range, which is about 200 miles from the Pacific, constitutes the watershed between the rivers which run east to the Atlantic and west to the Pacific. The valleys of the Peace River, or Unjigah, and its tributaries, contain very little level ground. Steep rocks commence at a short distance from the banks of the rivers. In some places the summits of these rocks extend in level plains to some distance from the lower valley of the river, but in others their surface is broken into small ridges or isolated hills. These rocky masses are furrowed by narrow valleys, in which the tributaries of the Upper Peace River run with great rapidity between steep rocks. Though it is very cold in these elevated valleys, even in the earlier part of the summer, and this region on that account is only visited by the native tribes in that season, yet nearly the whole of it is covered with trees, whilst the mountains farther south are generally bare, or only clothed with stunted trees and shrubs. The low tracts along the Peace River and some of its tributaries are covered with willows and alders, interspersed with spruce and white birch, and the uplands are overgrown with pines, cypress, spruce, and some other trees. Later information confirms these observations of Mackenzie. North of 52° or 53° N. lat. the forests that cover the declivities of the Chippewyan Mountains are very extensive, and the trees themselves are large and of very vigorous growth.

North of 57° the mountains appear rather to sink lower, than to rise. We have no information as to the elevation and character of the mountain-system as far north as 62°. It seems, that it occupies a much greater width, and consists of three or more ranges running parallel to one another, or nearly so, in the direction of the whole chain. Owing to this circumstance, the watershed between the rivers which fall respectively into the Atlantic and Pacific is advanced much more to the west, and seems to occur about 100 miles from the shores of the Pacific. The Turnagain River, which after having left the mountain-region assumes the name of the Southern Branch of the Mackenzie, rises on the watershed just mentioned, and breaks through two ranges of mountains before it reaches the great plain east of the Chippewyans. Between the ranges which fill up this immense tract of country there are low tracts, which however are partly covered with water, if it be true, as it is said, that about one-sixth of the entire surface of this region consists of extensive lakes. This circumstance shows that the mass of snow which falls every winter must be very great, and that the general slope of the country must be gradual. It is said that a great part of the country is also covered with trees.

Between 62° and 69° N. lat. the eastern ranges of the Chippewyan Mountains approaches the valley of the Mackenzie River, and within these limits they were seen by Franklin on his second expedition to the Polar Sea. Dr. Richardson says that they appear to consist of short conical peaks, scarcely rising 2000 feet above the river. Lateral ridges project from their sides, which stretch south-south-west and north-north-east, being nearly at right angles to the general course of the great range, to which they belong. Their bases are from one to two miles wide, and their eastern slopes present a succession of precipices, with shelving acclivities beneath them, formed of débris, and exhibit on their faces regular lines of stratification. The valleys which separate these ridges and open upon the river, are narrow, with level bottoms, but very steep sides well clothed with trees. One of these ridges presents towards the river a very precipitous descent, 1200 feet high, which extends for at least 15 miles. According to information obtained on the spot, the mountain-range consists of 14 or 15 ridges, of which the three easternmost are the most rugged, those that succeed being broader and more rounded. It seems that a large portion of this mountain-region is drained by the Peel River, which breaks through the eastern ridge near 67° 40′ N. lat., but is only known at its junction with the Mackenzie River, where it is a river of considerable size, and brings down a great volume of water.

The statement, that the most northern portion of the Chippewyan Mountains consists of several parallel ridges is partly confirmed by the manner in which this mountain-sytem terminates on the shores of the Arctic Ocean. Between the embouchure of the most western arm of the Mackenzie River (137° W. long.) and 146° W. long., four distinct ridges are seen from 12 to 25 miles from the shore. At their northern extremity, they are divided from one another by valleys about 20 or 30 miles wide. The summits of the two eastern chains, called Richardson Chain and Buckland Chain, are lower, being free from snow in summer, but the two western, called British Chain and Romanzow Chain, are always covered with snow. Romanzow Chain occupies the greatest width, and presents to the Arctic Ocean a front exceeding 60 miles in extent. These chains consist of slate-rocks; their summits are rounded and naked, but the narrow valleys between them are covered with grass. No bushes nor even shrubs appear on their declivities. At a great distance farther west, between 151° and 152°, the northern extremity of another chain, called Pelly Mountains, is seen from the shores of the Arctic Ocean, but it is not known if this chain is connected with the Chippewyans.

It is not improbable that the mountain-chain which is observed to skirt the shores of the Pacific, at no great distance from the sea, and in numerous places to advance with its offsets close to the water's edge, forms a part of the Chippewyan system and is connected with it. But on this point we are without information, the interior of the countries along this coast not having been visited by Europeans. Nor do we know how far the rocky peninsula of Aliaska, with its snow-capped volcanoes, may be considered as an appendage of the Chippewyan Mountains, as the interior of that large peninsula, which extends between the Pacific and the Arctic Sea, is closed against our researches by the inhospitable nature of the country.

Nothing certain is known respecting the minerals of this range. Some traces of iron and lead have been observed. Rock-salt exists in several places, especially in the Southern Chippewyans, where several rivulets occur, whose water is salt or brackish. Coal has been found in several places in the Northern Chippewyans, especially in the southern portion, near the Saskatchevan and Peace River, and also towards the mouth of the Mackenzie River.

(Humboldt's *Essai Politique sur la Nouvelle Espagne*; Pike's *Exploratory Travels through the Western Territory of North America*, &c.; James's *Account of Major Long's Expedition to the Rocky Mountains*; Lewis and Clarke's *Travels to the Source of the Missouri*, &c.; Irving's *Astoria*; Mackenzie's *Voyages through the Continent of North America to the Frozen and Pacific Oceans*; Franklin's *Second Expedition to the Polar Sea*; Dease and Simpson's 'Account of the recent Arctic Discoveries,' in the *London Geographical Journal*, vol. viii.)

ROD. [PERCH.]

RODE'NTIA, *Rongeurs*, the name of Cuvier's fifth family of mammals.

Speaking of the *Phalangers* [MARSUPIALIA, vol xiv., p. 460], Cuvier observes that their canine teeth are so small that they may be considered as null; and, consequently, the nourishment of those animals consists in great part of vegetable productions; their intestines are long, and their cæcum ample; and the Kanguroos, which are entirely without canines, live altogether upon herbage. He then states that the series of animals under consideration, and which possess a still less perfect mastication, may be commenced by the Wombat. [MARSUPIALIA, vol. xiv., p. 463.]

Cuvier in continuation remarks that two great incisor teeth in each jaw, separated from the molars by a wide space, could hardly seize a living prey, nor rend flesh; they could not even cut aliments, but they might serve for reducing them by continued labour into fine molecules—in a word, for gnawing them; whence the term *Rodents*, or *Gnawers*, applied to this order. With these weapons they attack the hardest vegetable productions, and frequently feed on wood and bark. The better to effect this object, these incisors have enamel in front only, so that their posterior border being worn away more than their anterior edge, they are always kept set like a chisel; their prismatic form causes them to grow from the root in proportion to the wearing down of their cutting edge, and this disposition to grow or push forward from the root is so strong, that if one of them is lost or broken, its antagonist, meeting with no opposition to keep it within bounds, develops itself so as to become monstrous. [Beaver, vol. iv., p. 121.] The lower jaw is articulated by a longitudinal condyle, so as to have no horizontal movement except from behind forwards, and *vice versâ*, convenient for the action of gnawing; the molars consequently have flat crowns, the enamelled eminences of which are always transversal, so as to be in opposition to the horizontal movements of the jaw, and to be better adapted for trituration.

The genera in which these eminences are simple lines, and which have the crown of the tooth very flat, are more exclusively frugivorous; those which have the eminences divided into blunt tubercles are omnivorous; and, finally, the small number of those which have points more willingly attack other animals, and approximate a little to the *Carnivora*.

The form of the body of the Rodents is in general such that their hinder parts exceed their anterior ones, so that they leap rather than walk; this disposition in some of them is as excessive as in the kanguroos.

The intestines of the animals of this order are very long; their stomach simple or slightly divided, and their cæcum often very voluminous, even more so than the stomach. The *Myoxi* (Dormice) want the cæcum.

Preparations illustrative of the male organs of the *Rodentia* will be found in the *Physiological Series* of the Museum of the College of Surgeons: Nos. 2483 to 2504, both inclusive: of these Nos. 2483 to 2487, exhibiting those of the Beaver with the preputial or castor-pouches, and Nos. 2492, 2492 A, those of the Acuchi with the penis armed on each side with a dentated horny ridge, are remarkable. Those of the other *Cavies*, Nos. 2493 to 2497 (both inclusive), exhibit similar peculiarities. The placenta is simple. Preparations Nos. 2742 to 2751, both inclusive, illustrate the female organs.

The brain of the Rodents is nearly smooth and without convolutions; the orbits are not separated from the temporal fossæ, which have but little depth; the eyes are entirely directed laterally; the zygomatic arches, delicate and curved below, announce the weakness of the jaws; the fore-arms have scarcely any rotatory motion, and their two bones are nearly united; in a word, the inferiority of these animals shows itself in the greater part of the details of their organization. Nevertheless, the genera which have the strongest clavicles enjoy a certain dexterity, and use their fore-feet for carrying their food to their mouth: others again (the squirrels) climb trees with facility. (*Règne Animal.*)

The following animals are arranged by Cuvier under the order *Rodentia*:—

The Squirrels (*Sciurus*, Linn.), viz.: the Squirrels properly so called (*Sciurus*, Cuv.); the Flying Squirrels (*Pteromys*); the Aye-Aye (*Cheiromys*).

The Rats (*Mus*, Linn.), viz.: the Marmots (*Arctomys*, *Spermophilus*); the Dormice (*Myoxus*, Gm.); the Spiny Rats (*Echimys*), *Hydromys*, *Capromys*; the Rats properly so called (*Mus*, Cuv.); the Jerbilles (*Gerbillus*, *Meriones*); the Hamsters (*Cricetus*); the Field Rats (*Arvicola*, Lacép.), subdivided into the Ondatras (*Fiber*, Cuv.), the ordinary Field-Rats (*Arvicola*, Cuv., *Hypudæus*, Ill.), and the Lemmings (*Georychus*, Ill.); *Otomys*, and the Jerboas (*Dipus*, Gm.).

The Jumping Hares (*Helamys*, F. Cuv.; *Pedetes*, Ill.).

The Rat-Moles (*Spalax*, Guld.).

Bathyergus (*Oryctères*, F. Cuv.).

Geomys (*Pseudostoma*, Say; *Ascomys*, Licht.)

Diplostoma, Raf.

The Beavers (*Castor*).

The Couias (*Myopotamus*, Com.).

The Porcupines (*Hystrix*, Linn.), viz.: the Porcupines properly so called (*Hystrix*, Cuv.); *Atherurus*, Cuv.; *Erethizon*, F. Cuv.; and the Coendous (*Synetheres*, F. Cuv., *Cercolabes*, Brandt).

The Hares (*Lepus*, Linn.), viz.: the True Hares (*Lepus*, Cuv.), and *Lagomys*, Cuv.

The [illegible]ybara (*H*[illegible]*ch*[illegible]*us*, Erxl.).

The [illegible] F. Cuv.; *Cavia*, Ill.).

[illegible] Cuv.).

[illegible] (*Chloromys*, F. Cuv.; *Dasyprocta*, Ill.),

Pacas ([illegible]*ys*, F. [illegible].).

[illegible] G. R. Gray [illegible] that the animals of this [illegible] to a [illegible] gives the following [illegible] according to their [illegible] of Philosophy,'

* Fur, *with scattered larger hairs or spines; tail spiny or scaly.*

Family 1. *Muridæ*; 2. *Histricidæ*.

** *Fur nearly equally soft; tail none, or hairy.*

Fam. 3. *Leporidæ*; 4, *Jerboidæ*; 5, *Aspalacidæ*. For the further development of Mr. Gray's arrangement, see the articles Leporidæ, Muridæ, and Porcupines.

Mr. Swainson (*Classification of Quadrupeds*) divides the *Glires*, or *Gnawing Quadrupeds*, into two main divisions, viz.: 1, Those with clavicles; 2, those with rudimentary, or no clavicles; and a third division, *Marsupial Rodentia*, 'situation uncertain.'

The first division consists of the genera *Castor*, *Fiber*, *Myopotamus*, *Rats and Mice*, and *Squirrels*. [Muridæ, vol. xv., pp. 496, 497.]

The second division embraces the genera *Hystrix* (with the subgenera *Acanthion*, *Erethizon*, *Synætheres*, and *Sphigurus*), *Lepus* (with the subgenus *Lagomys*), and *Cavia* (with the subgenera *Hydrochærus*, *Cobaya*, *Cavia*).

Under the Marsupial Rodents are placed the genera *Phascolomys* (with the subgenus *Amblotes*), and *Phascolarctôs*.

In the 'Magazine of Natural History,' New Series (1839), will be found Mr. Waterhouse's interesting 'Observations on the *Rodentia*, with a view to point out the groups as indicated by the structure of the *Crania* in this order of Mammals.' And in November, 1839, the same accurate observer laid before a meeting of the Zoological Society of London a tabular view of the distribution of this numerous order.

Mr. Waterhouse stated, that in the construction of the following table he had endeavoured to display the geographical distribution of the sections of the order *Rodentia*, and that to accomplish this, it of course became necessary to combine some system of classification, with an arrangement of the genera according to the countries in which they were found. The table is divided into five columns, one column being devoted to each of the following portions of the globe: 1st, Europe and North Asia; 2nd, North America; 3rd, Africa; 4th, India and the Indian islands; 5th, South America and the West Indian islands.

In these columns the names of the genera found in each province are inserted, and the number of known species belonging to each genus (as nearly as can be ascertained) is also indicated. Horizontal lines separate the genera according to the sections to which they are supposed to belong.

The few Rodents found in Australia all belong to the family *Muridæ*. About six species are known, and these appertain to the genera *Mus*, *Hapalotis*, Licht. (which is the *Conilurus* of Mr. Ogilby), *Hydromys* and *Pseudomys*.

'The first thing that strikes the attention,' observed Mr. Waterhouse, 'is, that the great mass of South American Rodents belong to a different section from those of the northern portions of the globe, and that they are of a lower grade of organization, as is also the case with respect to the Old and New World Monkeys.'

The next point to which Mr. Waterhouse drew attention was the relative number of species found in warm and in temperate climates. 'If the number of species found in the two provinces, Europe (including North Asia) and North America, be added together, the total is 180 species; whilst in all the rest of the world taken together the amount is only 206; and if from this last number those species which inhabit the temperate portions of South America and Australia (amounting to about 30) be deducted, and added to the first amount, it would appear that the Rodents are most abundant in temperate regions. In the Mammals of large size the case is reversed.

'The total number of species inhabiting each of the provinces pointed out in the table varies less than perhaps might be expected. The European province, North America, and South America, are nearly equal as to the number of species they contain; India and Africa are also nearly equal, but they contain fewer species than either of the other provinces.

'The Squirrels, Rats, Porcupines, and Hares (constituting the genera *Sciurus*, *Mus*, *Hystrix*, and *Lepus*) are the only groups which are found in all the provinces.

'The *Sciuridæ* abound most in North America and India, and are least abundant in Africa and South America. In the latter country they appear to be chiefly confined to the northern portions, and are totally wanting in the southern.

'The *Muridæ* are about equally abundant in Europe, Africa, and South America; in North America and India they are much less numerous.

'The *Arvicolidæ* appear to be confined to North America and the European province. In South America they are apparently replaced by the *Octodontidæ*, *Chinchillidæ*, and *Caviidæ*.

'The family *Leporidæ* is but feebly represented in each of the provinces above mentioned, excepting in North America, where the number of species already discovered is almost equal to all those found in other portions of the globe taken together. In earlier periods these Rodents, which are very low in the scale, appear to have been much more numerous, judging from the fossil remains which have been found—at least in the European province.

'The remaining families of Rodents are almost entirely confined to South America. The genus *Aulacodus* of Western Africa, the genera *Petromys*, an inhabitant of the Cape of Good Hope, and *Bathyergus*, found both at the Cape and north-eastern portions of Africa, possess certain characters in which they approach the South American forms. *Petromys* analogically appears to represent the Octodons of South America, and *Bathyergus* may be compared to the genera *Poephagomys* and *Ctenomys*; whilst in *Aulacodus* we possess a representative of the *Capromys* of the West Indies.'

		Europe and North Asia.	North America.	Africa.	India and Islands.	South America and West India Islands.
MURINA ……	*Sciuridæ* ….	5. Sciurus. 1. Pteromys. 1. Tamias. 8. Spermophilus. 2. Arctomys.	20. Sciurus. 3. Pteromys. 5. Tamias. 10. Spermophilus. 3. Arctomys. 1. *Aplodontia.*	5. Sciurus. 3. Xerus.	25. Sciurus. 9. Pteromys.	6. Sciurus.
	Muridæ ..	3. Myoxus.		2. Graphiurus. 3. Myoxus.		
		8. Dipus.	2. Meriones.	4. Dipus.		
		16. Mus.	6. { Mus. Hesperomys.	10. Mus. 2. Dendromys. 6. Gerbillus. 1. Psammomys. 3. Euryotis.	12. Mus. 3. Gerbillus. 1. Phlœomys. 2. Rhizomys.	30. { Mus. Hesperomys. 3. Reithrodon.
		6. Cricetus.	1. Sigmodon. 2. Neotoma.			
	Arvicolidæ ..	1. Castor. 20. Arvicola. 4. Lemmus. 2. Spalax.	1. Castor. 1. Ondatra. 8. Arvicola. 4. Lemmus. 10. Geomys.			
HYSTRICINA .	*Hystricidæ* ..	1. Hystrix.	1. Erethison.	1. Hystrix.	1. Hystrix. 1. Atherura.	3. Cercolabes. 2. Synetheres.
				1. Aulacodus 1. Orycterus. 4. Bathyergus. 1. Petromys.		3. Capromys. 1. Myopotamus. 10. Echimys. 6. Nelomys. 1. Cercomys. 2. Dasyprocta. 1. Cœlogenys.
	Octodontidæ …	……………	……………	……………	……………	2. Ctenomys. 1. Poephagomys. 1. Octodon. 2. Abrocoma.
	Chinchillidæ ..	……………	……………	……………	……………	1. Chinchilla. 2. Lagotis. 1. Lagostomus.
	Caviidæ ……	……………	……………	……………	……………	6. Cavia. 2. Kerodon. 1. Dolichotis. 1. Hydrochœrus.
LEPORINA …	*Leporidæ* …	5. Lepus. 3. Lagomys.	15. Lepus. 1. Lagomys.	6. Lepus.	4. Lepus. 1. Lagomys.	1. Lepus.
		81 spe. 16 gen.	99 spe. 19 gen.	53 spe. 16 gen.	58 spe. 10 gen.	89 spe. 25 gen.

Mr. Waterhouse observed, 'that he had not yet been able to satisfy himself as to the precise situation, in a systematic classification, of the genera *Ctenodactylus* and *Helamys*, the former from North and the latter from South Africa. Four other genera are omitted in the above table for the same reason; they are *Otomys** of Dr. Smith, a genus found at the Cape of Good Hope; *Akodon*, Meyen, which inhabits Peru; *Heteromys*, Desmarest, founded on the *Mus anomalus* of Thompson, an animal found in the island of Trinidad: and lastly, *Saccomys* of F. Cuvier, which is supposed to be from North America. These four genera in all probability belong to the family *Muridæ*.

'The genus *Aplodontia* is placed with *Sciuridæ*, but it must be observed that it differs much from the typical species of that group, there being no post-orbital process to the skull, and the molar teeth being rootless.' (*Zool. Proc.*)

The student should further consult *The Zoology of the Voyage of H.M.S. Beagle*, Nos. ii., iii., iv. of part ii. (*Mammalia*), where many Rodents are described and figured, and the characters of the *Octodontidæ* (pp. 83, 84) clearly pointed out.

We have good reason for stating that besides the *Leporidæ*, which differ considerably from all other groups of Rodents, there are only a few genera which Mr. Waterhouse has not yet sufficiently examined to determine satisfactorily to himself how many families they form. These genera are the South American forms *Capromys*, *Myopotamus*, *Echimys*, *Cercomys*, *Dasyprocta*, and *Cœlogenys*; they are, in his opinion, certainly very nearly allied to each other, and may perhaps with propriety be collected into one family under the name of *Dasyproctidæ*. There are moreover certain African genera which Mr. Waterhouse has not yet had an opportunity of thoroughly examining. Some observations by the same author on the families *Chinchillidæ* and *Caviidæ* will be found in the *Zoological Proceedings* for 1839 (p. 61).

Brandt has admirably worked out the family *Hystricidæ*, in his *Mammalium Exoticorum novorum, vel minus rite cognitorum, Musei Academici Zoologici Descriptiones et Icones, &c.* (Petropoli, 1835) 4to.

Fossil Rodentia.

Dr. Lund, in his view of the Fauna of Brazil, previous to the last geological revolution,* after noticing the living Rodents inhabiting that district, proceeds to notice the remains found in the limestone caves there.

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* This is a different genus from the *Otomys* of Cuvier, which is *Euryotis* of Brandt.

* There is a good translation of this most interesting paper in the *Magazine of Natural History*, New Series, 1840.

He commences with the common Brazilian wood-rat, *Mus lasiurus*, observing that he knows of very few caves in which remains of this animal are not found, and that in many they occur in such prodigious quantities as to excite astonishment. He cites as an instance the numbers which he found in a cavern near Caxoero do Campo, which is 120 feet long, from 6 to 9 feet wide, and from 30 to 40 feet high. Its floor for a distance of 20 feet from the entrance was covered with a bed of earth perfectly identical with the soil outside, and which had evidently been washed in by rain-water. Farther in, this bed of earth disappeared, and was replaced by a layer of very loose brownish or black mould, about a foot thick, and completely full of small bones, more abundant in some places than in others. Dr. Lund filled a box, containing about half a cubic foot, with this mould; and counted in it about 2000 separate *rami* of the under-jaw of *Mus lasiurus* and about 400 of *Didelphis murinus*, besides a small number of the jaws of other animals. Most of the bones were broken; the smaller ones only, such as those of the feet, the vertebræ, and the strongest long bones being entire. All the skulls were fractured, so that a portion of each was usually wanting: those which lay deepest were brown, brittle, and adhered to the tongue; the uppermost bones were all very fresh. Upon the surface of the earth the *elytra* and legs of beetles were scattered. Dr. Lund is of opinion that the *Strix perlata*, which is met with abundantly in the caverns, is the predatory animal which collected these bones. The remains of the Paca and Gutiá are frequently found unconnected with the heaps of bones cast up by the owls.

Dr. Lund further observes that the most numerous genus of the family of Rodents is the genus *Mus*, with six species of which, indigenous to the district, he is acquainted, besides two which have been introduced from Europe (*Mus musculus*), the other, as he suspects, from Asia (*Mus setosus*, Lund). The abundant remains of this genus collected by him from the caverns prove its existence in the antient world. The species, difficult to distinguish by external characters, are, he remarks, still more so when fragments only of their skeletons remain. He was however able to make out two or perhaps three extinct species. In several caverns he found remains of a fossil species of *Echimys* which approaches very nearly to *Echimys Apereoïdes*, Lund. He also found traces of a species belonging to the fossil period which agree very closely with *Echimys sulcidens*. A gigantic *Synetheres* (*Cercolabes*, Brandt) belonged to the antient Fauna of the district; for the fragments in the possession of Dr. Lund indicate a creature very little inferior in bulk to the wild hog. The fossil species moreover presents, he tells us, a nearer resemblance to the smaller existing species (*Syn. insidiosa*) than to the larger (*Syn. prehensilis*), so that, he observes, it would be classed, by those zoologists who make a generic division, between these two species, under the genus *Sphiggurus*. He discovered a small Rodent which did not agree with any of the genera at present existing in that country. The fossil remains of the genera *Lepus* and *Anæma* were abundant in the caves, and those of a species of *Dasyprocta* still more so: these more or less closely resemble the recent species of their respective genera. A second species of *Dasyprocta* was rare and of extraordinary size, the long bones of the hinder extremities being almost as large as those of the roebuck. Dr. Lund proposes the name of *Dasyprocta Capreolus* for this fossil animal. Of the *Capivar* or *Cupybara* two fossil species were found; one identical with that now in existence, the other of great size. For this last Dr. Lund proposes the name of *Hydrochærus sulcidens*. It was nearly five feet in length, so as to stand, as Dr. Lund observes, midway between the existing species of this genus and the South American Tapir. The remains of the genus *Paca* (*Cælogenys*) were found fossil in most of the Brazilian caves, and were amassed to a great extent. Two extinct species are named by Dr. Lund—*Cælogenys laticeps* and *Cælogenys rugiceps*: a third, much larger, having been not inferior to the living *Capybara*, is named by him *Cælogenys major*.

Dr. Lund remarks that with reference to the numerical
of this order in the present and former periods,
that only one of the existing Brazilian genera is
from the list of fossil genera, namely, that of the
Dr. Lund further observes that the total num-
cies at present existing in the district examined
– 18: but he only discovered 16 belonging to the
na. This however does not militate against his opinion that the antient Fauna was numerically richer than the modern in animal forms.

Notices of the fossil animals belonging to this order will also be found under the articles which treat of the families and genera.

RODERIC, the thirty-fourth and last of the Visigothic line of kings who filled the throne of Spain from 411 to 711. The circumstances which attended the elevation and fall of this prince are as doubtful as most events of that dark period. He appears to have been the son of Theodofred, duke of Cordova, and the grandson of Chindaswind. Having been entrusted by Witiza with the command of the army, Roderic revolted against his sovereign in 708, deprived him of the crown, and banished him to Toledo. For some time after his usurpation, Roderic had to contend against the sons and partisans of the dethroned monarch, who had taken refuge in the northern provinces of Spain. At last the sons of Witiza, perceiving their inability to cope with the forces of the usurper, crossed over to Africa, where they were kindly received by Ilyan (the Count Don Julian of Spanish chronicle), lord of Ceuta and Tangiers, and a friend of Witiza, who offered, if assisted by the Arabs, whose tributary he was, to restore the princes to the dominions of their father. Having communicated his project to Músa Ibn Nosseyr, then governor of Africa for the Khalifs of Damascus [MUSA; MOORS], that general, who had long wished to carry his arms into Spain, gladly embraced the opportunity offered to him, and promised his powerful assistance. By his orders Tarif Abú Zorah, with four hundred Berbers, landed at Tartessus (since called Tarifa, in commemoration of this event), and after ravaging the adjoining country, returned to Africa laden with plunder and captives. This happened in Ramadhán, A. H. 91 (Oct., A.D. 710). The success of the enterprise filled the Arabian Amír with joy, and a second and more formidable expedition was, the ensuing year, directed against the shores of Spain, on Thursday the eighth of Rejeb, A.H. 92, answering to the 30th April, 711. Tárik Ibn Zeyyád, a freedman of Músa Ibn Nosseyr, landed with eight thousand men at the foot of the rock of Calpe, to which he gave his own name, *Jebal Tárik* (the mountain of Tárik), since corrupted into Gibraltar. Soon after their landing, Tárik and his followers were attacked by Theodomir, the governor of Andalucia. The Goths however were unable to force the positions taken up by Tárik, who, seeing his number daily increase by fresh reinforcements from Africa, descended into the plain, and advanced without opposition as far as Medina Sidonia. He was there met by Roderic, who, at the head of numerous but ill-disciplined forces, hastened to repel the invasion. After some sharp skirmishing, which lasted for six consecutive days, the two armies came to a general engagement on the 5th of Shawwál, A.H. 92 (26th July, 711). According to Ar-rází and other historians, this memorable battle, which decided the fate of the Gothic monarchy, was fought on the banks of the river Barbate, not on those of the Guadalete, as the generality of the Christian historians have erroneously asserted. It was at first hardly contested on both sides, until the defection of Oppas and other partisans of Witiza, to whom Roderic had imprudently entrusted the command of the right wing of his army, gave the victory to the Arabs. The rout then became general, and the flower of Gothic chivalry fell by the sword of the Arabs, Roderic himself being in the number of the slain. This last fact has been brought into question by the generality of the Spanish historians, from Rodericus Toletanus down to Masdeu, on the ground that Sebastianus Salmanticensis, a monk and chronicler of the tenth century (in *Flores*, *Esp. Sag.*, vol. xiii.), speaks of a tomb being discovered in his time, at Viséo in Portugal, bearing this inscription, '*Hic requiescit Rodericus ultimus Rex Gothorum*;' from which they conclude that Roderic escaped the field of battle, and retired into Portugal, where he passed the remainder of his days in penance and prayer. The statement however is entitled to little credit; for not only have we the testimony to the contrary of the Arabian writers, who universally agree that Roderic perished in the action, though they are divided as to the manner of his death, some asserting that he was slain by Tárik, and others that he was drowned in attempting to cross the river; but the assertion is further corroborated by Isidorus Pacensis, and the anonymous continuator of the 'Chronicon Biclarense'—two contemporary Christian writers, who positively declare that Roderic died in the action. Roderic's reign had lasted nearly three years. There is a fabulous chronicle of this king, or rather a romance of chivalry, in which the popular traditions current among Moors and Christians respecting the invasion and conquest of Spain, as well as many ridiculous fables like that of Florinda, and the enchanted Tower of Toledo, have been embodied by an anonymous writer of the fourteenth century. It was printed for the first time at Toledo, 1549, and has since gone through several editions. Another fabulous history of Roderic and the events in which he was engaged, was written towards the middle of the sixteenth century, by a converted Moor of the name of Luna (Granada, 1592, 4to.). These, and other books of the same stamp, have furnished ample materials for some of the best works in English literature. (Scott, Southey, and Irving.)

(Al-makkari's *History of the Mohammedan Dynasties in Spain*, vol. i., chaps. 1 and 2.)

RODNEY, ADMIRAL, LORD. George Brydges Rodney was born at Walton-upon-Thames, in the county of Surrey, February 19, 1718. He was taken from Harrow School, and sent to sea at twelve years of age. In 1739 he was made a lieutenant; in 1742, a captain; and in 1748 he was sent out as governor and commander-in-chief on the Newfoundland station, with the rank of commodore.

In October, 1752, Rodney returned to England, and was elected member of parliament for the borough of Saltash. He was appointed successively to the Fougueux, 64 guns; the Prince George, 90; and the Dublin, 74. After twenty-eight years of active service, he was raised to the rank of rear-admiral, May 19, 1759.

In 1761 Admiral Rodney was appointed commander-in-chief at Barbadoes and the Leeward Islands. Having captured the islands of Martinique, Santa Lucia, and Granada, he was recalled on the conclusion of peace in 1763. Soon after his return he was created a baronet, and by successive steps reached the rank of vice-admiral of the red. He was also appointed governor of Greenwich Hospital; but resigned this office on being sent out, in 1771, as commander-in-chief on the Jamaica station. In 1774 he was recalled.

Under the pressure of pecuniary difficulties, Sir George Rodney now retired to Paris, where he remained till May, 1778, when he was promoted to the rank of admiral of the white, and in the autumn of 1779 was again appointed commander-in-chief on the Barbadoes station, for which he sailed December 29, 1779. His fleet consisted of 22 sail of the line and 8 frigates. France and Spain were at this time united against England. Before he had been ten days at sea he had captured seven Spanish ships of war, and on the 16th of January, 1780, fell in with a Spanish fleet, under Admiral Langara, near Cape St. Vincent, consisting of 11 ships of the line, and 2 frigates. Of these five were taken and two destroyed; but the action being in the night, and the weather tempestuous, the rest escaped.

On the 17th of April, 1780, Rodney came in sight of the French fleet, under the Comte de Guichen, near Martinique. Rodney intended to attack the enemy, which was a little superior, with his fleet in close order; but the greater part of his captains disobeyed, and kept at a cautious distance. Only five or six ships supported him, while in his own, the Sandwich, he engaged a 74 and two 80-gun ships for an hour and a half, and compelled them to bear away, and broke through the enemy's line. In his dispatches Rodney censured the conduct of his captains, but the Admiralty suppressed the passage, and only one of them was brought to trial, who was dismissed from the service. The admiral was rewarded with the thanks of the House of Commons, and a pension of 2000*l.* a-year, to be continued after his death to his family in specified portions for their respective lives. In 1780, he was chosen, free of expense, to represent the city of Westminster, and was also made a Knight of the Bath. Soon afterwards war was declared against the states of Holland, and instructions were sent to Rodney to attack their possessions in the West Indies. The Dutch island of St. Eustatius surrendered, without a shot having been fired, Feb. 3, 1781; and in the course of the spring, the Dutch colonies of Demerara, Essequibo, and Berbice were taken. Rodney, having returned to Europe in the autumn of 1781 for the recovery of his health, was received with universal enthusiasm, was created vice-admiral of England in the place of Admiral Hawke, deceased, and was appointed to the command of the whole of the West Indies. Both the French and Spanish fleets were at this time in the West Indies, and it was intended to form a junction, and attack Jamaica and the other British possessions. The French fleet was commanded by the Comte de Grasse, and consisted of 33 or 34 sail of the line, besides frigates. Intelligence having been brought to Rodney, on the 8th of April, 1782, of their having sailed from Fort Royal Bay, Martinique, he immediately followed them. A partial action took place on the 9th, when two of the French ships of the line were disabled, and a third was rendered useless by an accident in the night of the 11th, thus reducing the French fleet to 30 or 31 ships of the line. The British fleet was rather more in number, but much less in weight of metal. The general action commenced on the 12th of April, 1782, at seven o'clock in the morning, and lasted till half-past six in the evening. Rodney, in the Formidable, broke through the French line, and engaged the Ville-de-Paris, De Grasse's flag-ship, and compelled her to strike. The result was, that seven ships of the line and two frigates were taken by the British.

About this time the Whigs had come into office, and Rodney having been always opposed to them, an officer was appointed to succeed him, who had only just sailed when the news of this great victory reached England, and the Admiralty immediately sent an express to overtake and bring back the officer, but it was too late. Rodney reached England, September 21, 1782. He was raised to the peerage with the title of Baron Rodney, and received an additional pension of 2000*l.* a-year. He lived chiefly in the country, till May 23, 1792, when he died, in his 75th year. He was twice married, and left a numerous family. A monument was erected to his memory in St. Paul's cathedral, London, at the national expense. His portrait by Reynolds was in the royal collection at St. James's Palace, but has since been sent to Greenwich Hospital.

(*Gallery of Portraits*, vol. ii.; Mundy's *Life and Correspondence of Lord Rodney*, London, 2 vols., 8vo.)

RODOLPH. [Germany]

RODRIGUEZ, VENTURA, the most eminent Spanish architect of the eighteenth century, was born at Cienpozuelos, July 14, 1717, and commenced his first studies in his profession under Esteban Marchand, who was then employed on the works carrying on at Aranjuez. After the death of Marchand, in 1733, he still continued at Aranjuez, until Juvara engaged him as his assistant in making drawings for the design of the new palace at Madrid; and after the death of Juvara, he was similarly engaged by his successor Sachetti, with whom he was subsequently associated in the execution of that vast pile, as aparejador, or principal clerk of the works, 1741. In 1747 he was made honorary member of the Academy of St. Luke at Rome; and on that of St. Fernando being established at Madrid, in 1752, he was appointed chief director or professor of architecture in it, an office for which he was peculiarly fitted, not only by his talents, but by his zeal for his art, and his solicitude for the improvement of the pupils. Commissions poured in upon him from every quarter; for there was scarcely a work of any importance throughout the country on which he was not either engaged or consulted. He was employed on various cathedrals, churches, colleges, hospitals, and other structures at Zaragoza, Malaga, Toledo, Granada, Valladolid, and numerous other places; and a mere list of the works designed or executed by him would be one of considerable extent. We can here merely point out, as being among the more remarkable for their design, the sanctuary at Cobadonga, the church of San Felipe Neri at Malaga, that of the hospital at Oviedo, and the palace of the Duque de Liria at Madrid.

These multiplied engagements, and the frequent journeys which they occasioned him, prevented his visiting Italy; but he collected all works of engravings relative both to its antient and modern buildings. He also carefully studied the various monuments of Roman, Moorish, and Gothic architecture in his own country. He died at Madrid, 1785, in his sixty-eighth year, and was buried in the church of San Marcos, the only one in that capital erected by himself. Rodriguez has been honoured with an Elogio by the celebrated Jovellanos, to which we must refer those who wish for a more detailed notice of his character and works. He is also repeatedly mentioned with high commendation by Ponz, in his 'Viage de España;' and he doubtless deserves the title he received from his contemporaries, of the Restorer of Architecture in Spain; yet whether his merit lay chiefly in the reform of a puerile and vitious taste, and in purifying Spanish architecture from the barbarisms that had crept into it, or whether his works display any high degree of positive talent, is what we ourselves have not the means of judging.

ROEBUCK. [Deer, vol. viii., p. 360.]

ROGATION DAYS. It was a general custom formerly, says Bourne, and it is still observed in many country parishes, to go round the bounds and limits of the parish on one of the three days preceding Holy Thursday; when the minister, accompanied by his churchwardens and parishioners, used to deprecate the vengeance of God, beg a blessing on the fruits of the earth, and preserve the rights and properties of the parish. Spelman considers this custom as an imitation of the Roman Terminalia. The primitive custom used by Christians on this occasion was, for the people to accompany the bishop or some of the clergy into the fields, where Litanies were made, and the mercy of God implored, that he would avert the evils of plague and pestilence, that he would send them good and seasonable weather, and give them in due season the fruits of the earth. The Litanies or Rogations then used gave the name of Rogation Week to this time. They occur as early as A.D. 550, when they were first observed by Mamertius, bishop of Vienna, on account of the frequent earthquakes that happened, and the incursions of wild beasts, which laid in ruins and depopulated the city. (Walifred, Stral., c. 28, *De Repub. Ecclesiast.*) In the canons of Cuthbert, archbishop of Canterbury, made at Cloveshoo, in the year 747, it was ordered that Litanies, that is Rogations, should be observed by the clergy and people, with great reverence, on the seventh of the calends of May, according to the rites of the church of Rome, which terms this the Greater Litany, and also, according to the custom of our forefathers, on the three days before the Ascension of our Lord, with fastings, &c. (Wilkins, *Concil. Brit.*, p. 249; Spelm., *Gloss.*, *v.* 'Litania.') The continuance of this custom through later times is evidenced by old parish accompts, and by the various episcopal articles of inquiry. In the injunctions issued in Queen Elizabeth's reign, it is ordered that the curate, at certain and convenient places, shall admonish the people to give thanks to God, in the beholding of God's benefits, for the increase and abundance of his fruits, saying the 103rd Psalm, &c.; at which time the minister shall inculcate these or such sentences, 'Cursed be he which translateth the "bounds and doles of his neighbours," or such orders of prayers as shall be hereafter.'

Rogation Week, in the northern parts of England, is called Gang Week, from *to gang*, which in the north signifies to go. Ganᵹ-ƿuca, gang-week, occurs in the rubric to John, c. 17, in the Saxon Gospels; and Ganᵹ-ꝺaᵹay are noticed in the laws both of Alfred and Athelstan.

(Brand's *Popular Antiq.*, 4to. edit., vol. i., p. 168-178; Brady's *Clavis Calendaria*, 8vo., 1812, vol. i., p. 321-326.)

ROGER OF HOVEDEN. [Hoveden.]

ROGER OF SICILY. [Sicilies, Two—*History*.]

ROGUE AND VAGABOND. [Vagrant.]

ROHAULT, JAMES, was the son of a merchant at Amiens, where he was born in 1620. He received the rudiments of a scientific education in that city, and was afterwards sent to Paris for the purpose of prosecuting his studies in philosophy.

In that age the physical works of Aristotle had begun to give place to those of Descartes, and most of the learned men in France received with complacency the explanation of the phenomena of Nature which were given in the 'Principia,' the 'Dioptrice,' and the 'Meteora' of their illustrious countryman. Among the persons alluded to, Rohault was one who diligently studied the writings of the Greek philosopher and of his numerous commentators, but who also applied himself with ardour to the productions of the new school, of which he professed to be a zealous disciple. This circumstance appears to have brought him to the notice of Clarselier, who, being himself a warm Cartesian, conceived so great a regard for the young philosopher, that he gave him his daughter in marriage, and engaged him to write a commentary on the works of the man who was the object of their common admiration. Rohault seems to have executed the task assigned to him in a manner which gratified the wishes of his patron and father-in-law, and in the spirit of an enthusiastic follower; for in the preface to his 'Traité de Physique' he designates Descartes as a man who, by his works, had shown that France was capable of forming philosophers as illustrious as those of antient Greece. This work was translated into Latin by Dr. Samuel Clarke, and published with notes, in which are given explanations of the principal phenomena agreeably to the philosophy of Newton, which, in a very few years, had entirely supplanted that of the French school.

After the above-mentioned work was finished, Rohault appears to have been occupied for several years in giving instructions in mathematics, and the subjects of his lessons were published after his death in two volumes. The course comprehends geometry, both plane and practical; trigonometry, plane and spherical; fortification, mechanics, perspective, and arithmetic.

Besides the 'Traité de Physique,' Rohault published also a work entitled 'Entretiens sur la Philosophie,' consisting of a series of dialogues, in which the subjects are treated according to the Cartesian principles. He died in 1675.

ROHILCUND. [Hindustan, p. 218.]

ROLAND, MANON. Manon Philipon, for such was her maiden name, was born in Paris in 1756. Her father was an artist of moderate talent; her mother was a woman of superior understanding and of a singularly amiable temper. Manon learned to read so early and so easily as not to be able to recollect the process; and, having once learned to read, she read everything that came in her way. In her father's house she enjoyed, to a certain extent, the means of cultivating painting, music, and general literature. It is probable that her early devotion to these pursuits tended to exalt her imagination and to influence the whole of her future career. Whilst yet a girl, she was, at her own earnest request, placed for one year in a conventual school. At this age her religious enthusiasm was extreme; in after-years it subsided, and her opinions, she confesses, went through every change, until they rested in scepticism; a result in some degree due to her perusal of the writings of many celebrated authors. Her reading, under her father's roof, was of a most miscellaneous description. The works of the fathers and the free writings of the seventeenth and eighteenth centuries were equally accessible to her, and perused with equal avidity; but the most powerful and lasting impression was made on her by an early familiarity with Plutarch's 'Lives of Illustrious Men.' From this time, Greece and Rome were constantly present to her thoughts, and when she was fourteen years old, she is said to have wept to think that she was not a Roman or a Spartan woman.

At the age of five and twenty, she became the wife of M. Roland, a man twenty years her senior, of laborious habits, great ability and integrity, and manners described as of antique severity. A daughter was the fruit of this marriage, and Madame Roland's time became divided between the care of her child's education, and giving assistance to her husband, from whose knowledge she derived great advantage in return. He held the office of Inspector of Manufactures, of which he fulfilled the duties in a liberal spirit well according with the previous impressions of his enthusiastic partner. With him Madame Roland visited England, Switzerland, and other countries of Europe—everywhere industriously inquiring into the nature of the civil institutions, and manifesting the warmest sympathy with the advocates of political liberty. On witnessing the comforts enjoyed by the English cottagers, she is said to have observed, that in this country a handful of wealth did not constitute the nation, but that *man*, whatever his station, was reckoned as something.

The intense interest with which such a woman regarded the first movements of liberty in her own country, may easily be conceived. Her husband being appointed to represent the city of Lyon in the National Convention, left his residence near that city, and, accompanied by his wife, proceeded to Paris, where the curiosity of Madame Roland was gratified, and her zeal, if possible, increased, by the opportunity of observing some of the most distinguished actors on the political stage—as Mirabeau, Cazalés, Maury, Barnave, and others of less note. To the cause espoused by these notable persons Madame Roland and her husband were warmly attached; and, during the ministry of the party of the Gironde, Roland was appointed minister of the interior, for which his information, his assiduity, and his strict probity highly qualified him. It was, whilst holding this office, that he appeared at court with a round hat and strings to his shoes; and was regarded by the courtiers as a symbol of a monarchy about to fall. His sincere language was as unwelcome to the court as his plain attire was displeasing to the courtiers. The talents of his wife were at this time applied to assist him in the composition of public papers. Without pretending to direct him, she avows her belief that by mingling with the severer accents of patriotism the expressions and feelings of a woman of sensibility, she rendered these documents more impressive and effectual. The famous letter of M. Roland to Louis XVI. (May, 1792) was drawn up by her: a letter designated, according to the political feelings of the readers, as an enlightened although a severe remonstrance, or as audacious and full of evil prophecy. This production occasioned M. Roland's dismissal by the court; for which he was compensated by the warm applauses of the Convention. He again became a minister after the events of the 10th of August: but his party had then passed the bounds prescribed by his judgment, and entered upon extremes repugnant to his high-minded and generous wife. Still they were apparently favoured by their party, to whom Roland's character and popularity were necessary. Amidst the real and affected grossness of dress, manners, and language of the republicans, society preserved its respectability in the circle assembled round the table of the minister of the interior.

The events of the reign of terror do not require to be detailed. The frightful massacres in the prisons of Paris on the 2nd and 3rd of September, were boldly denounced by Roland in his capacity as minister; but the Convention, which applauded him, wanted courage, or virtue, or power to act upon his advice; and from that hour his own doom and that of his wife became only more certain. Madame Roland had herself been already arraigned before that assembly, on an absurd charge of treasonable correspondence with England; and by her presence of mind, her acuteness, and her wit, had baffled and mortified her accusers. The recollection of this defeat is said to have so haunted the minds of Marat, Danton, and Robespierre, that in every subsequent difficulty, and in every attack made upon their proceedings, they imagined they recognised the boldness, sagacity, or sarcasm of Madame Roland. She and her husband began to receive warnings of their danger, and for a short time consented to take the precaution of not sleeping at the Hôtel of the Interior. The appearance of deception was little agreeable to Madame Roland. 'I am ashamed,' she said, on an occasion on which she had almost consented to leave her house in the dress of a peasant, 'of the part I am made to play. I will neither disguise myself nor leave the house. If they wish to assassinate me, it shall be in my own home. This courageous example is due from me, and I will afford it.' Her husband quitted Paris, and she might have done so, but she declared that the care of evading injustice cost her more than it would do to suffer from it.

The time arrived when the intellectual superiority hitherto maintained in the Convention by M. Roland's party, or the Girondists, was overcome by absolute force. Forty thousand men were marched against the Convention, by the Jacobins, on the 31st of May, 1793; and in the evening of the same day Madame Roland was arrested and thrown into the prison of the Abbaye. Here she displayed her usual firmness, and continued to exercise towards the poor and unfortunate a benevolence for which in her prosperous days she had been remarkable. Before her friends she appeared cheerful; she always maintained the language of a patriot when speaking of the aspect of affairs, flattering and fearing none; and she professed herself capable of overcoming her ill-fortune. In solitude the feelings of the wife and the mother overcame her, and the attendants remarked that she passed many hours in tears. Her sufferings were greatly aggravated by her being one day unexpectedly liberated, as if the danger was past. She drove home with extreme delight; sprung out of the coach, as she says it had always been her habit to do, but with more than usual vivacity; and was running gaily up stairs, when she was again arrested by an officer, and at once taken to Sainte Pelagie, a prison of a lower order than the Abbaye, where she was shut up with the worst of her sex. In this second prison she remained until her trial and execution. The only explanation given of this circumstance was that her first arrest had been illegal. The wretchedness of her situation at Sainte Pelagie was only alleviated by her literary occupations, and by the kindness of her gaolers or of their families, whom her fascinating manners and behaviour converted into friends. Well knowing that her life would be sacrificed, she devoted all her hours to the composition of her Memoirs, writings full of lively description, entertaining anecdotes of her contemporaries, and remarks indicative of penetration and habitual reflection. A letter to her daughter, written in these circumstances, is one of the most affecting of farewells. But Madame Roland seldom gave way to melancholy emotions in her writings. Her pages detail the events of her childhood and youth with matchless sprightliness and grace, and, excepting in certain passages wherein candour is carried to an excess which modern delicacy would not permit to a female writer, her Memoirs are models of that kind of composition.

As the narrative advances, events of a deeper interest are related with great facility of expression, sometimes with mournful pathos, generally with great judgment, not always without satire, but always with easy eloquence. From a very early age we may discern in this relation the extraordinary decision of her character, her naturally commanding manners, her fervent but well-controlled temperament, her indefatigable love of improvement, and her unswerving adherence to truth.

Several unhappy prisoners delivered themselves from certain execution by taking poison; and Madame Roland had at one time resolved to do the same. But communicating her resolution to a friend, who represented to her that a nobler course would be to wait for death, and leave the memory of so great a sacrifice to the cause for which she had lived, she calmly determined to abide the result.

It was in the month of October (1793) that the Girondists were destroyed. On the 31st of that month she was sent to the Conciergerie. On the 10th of November she appeared before the Revolutionary tribunal. She had declined the proffered aid of M. Chauveau Lagarde, the great advocate of the Girondists, of the unfortunate queen, and of Charlotte Corday; knowing that no talents could save her, since her innocence could not, and not wishing to expose him to useless danger. Part of the night was occupied by her in writing her eloquent defence. Her courage did not desert her during her trial or at her execution. She sustained the insults of the unmanly tribunal, not without womanly emotion, but also with a dignity worthy of the greatest women of the times with which her early reading of Plutarch had made her familiar. To the last moment she preserved her presence of mind, and even her gaiety. On the same day and at the same hour a man was also to be guillotined; and in such extremity, to die first being thought a privilege, she waived it in favour of her less courageous companion in misfortune; overcoming the scruples of the executioner, whose orders were to execute her first, by representing to him the impoliteness of refusing a woman's last request. It is said that bending herself before the statue of Liberty, close to this scene of death, she exclaimed, 'Oh! Liberty! what crimes are committed in thy name!'

She had often been heard to say that her husband would not survive her. As soon as he heard of her execution, he took leave of two attached female friends in whose house, at Rouen, he had found a refuge, and to whom his resolution was known; walked in the evening of the 15th of November as far as Baudouin, four leagues on the road to Paris; sat down by the side of a tree in an avenue leading to a private house, and passed his cane-sword through his chest. By his side was found a paper, in which these words were written:—'Whoever you are who find me lying here, respect my remains; they are those of a man who devoted his whole life to being useful, and who died, as he had lived, virtuous and honest.'

These particulars are principally taken from a very recent edition of the 'Memoirs of Madame Roland,' published in Paris, in two volumes, 8vo., with abundant notes, by MM. Berville and Barrière.

ROLLE, MICHEL, a French mathematician, was born at Ambert in Auvergne, in 1652. He appears to have possessed from nature a remarkable facility in solving propositions relating to arithmetic and algebra, and to have acquired by practice a great proficiency in the calligraphic art. After having served during several years as an attorney's clerk, he came, in 1675, to Paris, where he obtained a subsistance as a writing-master, and where he spent his leisure time in cultivating the mathematical sciences. An accidental circumstance procured for him the notice of M. Colbert. Ozanam, who was himself a good analyst, hap

propose to mathematicians a problem of the kind
leterminate, which, he conceived, could be solved
process involving very high numbers, Rolle was
te as to discover a neat solution; and the minister,
rmed of it, was induced, in 1685, to recommend
ection as a member of the Academy of Sciences,
tly formed.

his time Rolle devoted himself to analytical pur-
d in 1690 he published a treatise on algebra, in
s work contains, among other methods for the
of equations, one which he calls the method of
a name given to it because it consists in succes-
ressing the equation one degree lower at each
. It has some analogy to a method given by
in the 'Arithmetica Universalis;' but its want of
has caused it ever since to be neglected. An
of peculiar modes of expression prevails through-
whole work, which is otherwise very obscurely
the author was however particularly skilful in the
ent of questions of the kind called diophantine,
ublished a treatise on that subject in 1699.

nfortunately for his fame, entered the lists as an
of the algebra of Descartes, and of the differential
hich had been then recently discovered by Newton
itz; and he is accused of using towards those who
red to point out his mistakes a tone of anger
ery unbecoming in a philosopher. He began in
tack the differential calculus, objecting both to its
and its applications; and, with respect to the
endeavoured to show that in particular examples
s are inconsistent with those which are brought
e antient processes. The new calculus, as it was
nd however in France a zealous and temperate
n Varignon, who, in replying to the objections of
plained the true meaning of the differential sym-
ointed out that the supposed discrepancies in the
the examples arose entirely from the haste and
cy of the objector.

spute agitated the French Academy of Sciences
time, Rolle continuing to raise one objection after
and though they were answered by Varignon, the
ways pretended to have the victory. It is said
cademy was then composed of men who had been
stomed to the antient analysis, and therefore saw
ure an opposition raised against methods to which
not yet reconciled. In 1705 however the Aca-
hout pronouncing a judgment on the subject, re-
ed that Rolle, in moderating his language, should
to the rules of the institution; and the dispute
time terminated. This was twenty-nine years
hop Berkeley attempted to revive the subject in
lyst.' [ROBINS.]

ears that, subsequently, Rolle acknowledged his
thus he may be supposed to have deserved the
posterity. He was admitted second geometrical
of the Academy in 1699, and he died on the 5th
719, at sixty-seven years of age.

ER (Ornithology), the name of an insessorial or
bird, *Coracias garrula*, Linn.

ifference of opinion has prevailed among ornitho-
to the place of the *Rollers* in the system.

s arranged the genus *Coracias* between *Corvus*
us. Pennant (*British Zoology*) gives it a position
the Nut-cracker and the Oriole; M. Duméril
between the Birds of Paradise and the Crows;
r arranged it in his second order, *Coraces*, among
stands in Illiger's method. Cuvier placed the
Coracias, Linn.) between the Crows (*Corvus*,
d the Birds of Paradise (*Paradisea*, Linn.), the
ssigned to them by Lacépède, and includes under
the Rollers properly so called (*Coracias garrula*,
.), and the *Rolles* (*Colaris*).

ot, like Meyer and Illiger, places the Rollers
Coraces.

ninck gives them a position between *Bombyci-*
Oriolus.

Blainville's method presents them between the
and Bee-eaters (*Merops*).

gors places them in his family *Corvidæ*. [COR-
viii., p. 67.]

son's family *Eurystomidæ* (*Rolliers* of Cuv.) con-
Rollers (*Galgulus*, Brisson, and *Coracias*, Linn.);
(*Eurystomus*, Vieill. [MEROPIDÆ, vol. xv., p. 118], *Colaris*, Cuv., and *Coracias*, Linn.); the genus *Mainatus* (*Eulabes*, Cuv., *Gracula*, Linn.); and the genus *Mino*, Less. M. Lesson rejects the term *Coracias*, because many authors have so dismembered it, according to their different views, that a confusion calculated to produce error is the result.

In the system of Mr. Swainson, who retains the generic name *Coracias*, the Rollers appear among the *Meropidæ*. [MEROPIDÆ, vol. xv., p. 118.]

The Prince of Canino (C. L. Bonaparte) arranges the genus *Coracias*, giving as an example the common Roller (*Coracias garrula*, Linn.) in the family *Ampelidæ* (*Birds of Europe and North America*).

In Mr. Gould's great work on 'The Birds of Europe,' the Roller (*Coracias garrula*) comes between the Bee-eater (*Merops Apiaster*) and the Kingfisher (*Alcedo aspida*).

Mr. Yarrell (*British Birds*) arranges the *Common Roller* under the family *Meropidæ*.

Description.—Bill black towards the point, becoming brown at the base with a few bristles; irides of two circles yellow and brown; head, neck, breast, and belly various shades of verditer blue changing to pale green; shoulders azure blue, back reddish brown, rump purple, wing-primaries dark bluish black, edged lighter, tail-feathers pale greenish blue, the outer ones tipped with black, those in the middle also much darker in colour; legs reddish brown; in old males the outer tail-feathers are somewhat elongated.

Adult females differ but little from the males; young birds do not attain their brilliant colour till the second year. (Gould, *Birds of Europe*.) Length about 13 inches.

This is the *Pica marina* and *Pica merdaria* of the Italians: *Rollier* of the French; *Birk-Heher*, *Blaue-Racke*, and *Mandelkrahe* of the Germans; *Spransk Kraka*, *Blakraka*, and *Allekraka* of the Swedes; *Ellekrage* of Brunnich; *y Rholydd* of the antient and *Roller* of the modern British.

Geographical Distribution.—This bird appears to have a wide range. In Europe, it is found in Denmark, Sweden (where it arrives with the Cuckoo), and the southern provinces of Russia; is more common in Germany than France, where however it has been found in Provence; and it has been taken at Gibraltar. In Italy, according to Prince C. L. Bonaparte, it is rather common, arriving in the spring and departing in September. In Malta and Sicily it is exposed for sale in the shops of poulterers, and is said to have the taste of a turtle-dove. In the Morea it is considered a delicacy in the autumn, when it is fat with its summer food. It has been captured at Aleppo, and at Trebizond and Erzeroum. It visits the countries between the Black and the Caspian seas; and Dr. von Siebold and M. Bürger include it among the birds of Japan. In North Africa it is found from Morocco to Egypt; flocks were seen by Adanson at Senegal, and he concluded that they passed the winter there. Dr. Andrew Smith records it among the birds of South Africa. In Great Britain it has been killed in Cornwall, in Suffolk and Norfolk, in Cambridgeshire, in Yorkshire, Northumberland, Perthshire, the east of Scotland, and Orkney. We can find no account of its occurrence in Ireland; but that it is known in Wales is evident from one of its names above given.

Habits, Food, &c.—Deep forests of oak and birch appear to be the favourite haunts of the Roller. In the 'Annals of Natural History' for 1839, it is stated by a traveller in Asia Minor, that the Roller, which was most common throughout the south and west parts of the country wherever the magpie was not found (for it was not seen in the same district with that bird), was observed to fall through the air like a Tumbler Pigeon. Temminck states that it makes its nest in the holes of trees, where it lays from four to seven eggs of a lustrous white. M. Vieillot states that in Malta, where trees are scarce, the bird builds on the ground. In Barbary it has been observed to form its nest in the banks of the Sheliff, Booberak, and other rivers; and Pennant remarks that where trees are wanting, it makes it in clayey banks. These last modes of nidification bring it very close to the Bee-eaters and Kingfishers, whose eggs quite resemble those of the Roller in colour and shape, and only vary in size. The male takes his turn to sit. The food is very varied, according to Temminck, who enumerates moles, crickets, cockchafers, grasshoppers, millipedes, and other insects, slugs and worms. Gould states that it feeds on worms, slugs, and insects generally. Yarrell informs us that the food consists of worms, slugs, insects in their various stages, and berries.

Bechstein observes that till lately he had thought that the Roller was untameable; but Dr. Meyer of Offenbach had convinced him to the contrary, having himself reared them in his room by the following method:—The young ones must be taken from the nest when only half grown, and fed on little bits of cow's heart, or any other meat which is lean and tender, till they can feed alone; small frogs, worms, and insects may then be added. Its mode of killing and swallowing insects is thus described:—it commences by seizing and crushing them with its bill, and then throws them into the air several times, in order to receive them in its throat, which is very capacious. When the morsel is too large, or the insect is still alive, the bird strikes it hard against the ground, and begins again to throw it into the air till it falls not across, but so as to thread the throat, when it is easily swallowed. Bechstein says that he had never seen the bird drink. The translator of Bechstein's interesting little book states that he once saw a Roller drink after having swallowed dry ants' eggs; it then ate greedily of lettuce and endive. 'Another which I kept,' adds the translator, 'liked the outside of lettuces and spinach after having eaten insects, especially beetles, which are very heating. To judge from what I have observed, the Roller is by nature wild and solitary; it seldom changes its situation, except to seek its food or to hide itself from strangers. It is a good thing, whether kept in a cage or let range, always to have a box in its way, in which it may take refuge when frightened; it will not fail to hide itself there, and by this means will not be tempted to beat itself violently, which it does when it cannot fly from the object of its fright. It knows its mistress very well, lets her take it up, comes near her, and sits without any fear on her knees for whole hours without stirring. This is as far as it goes even when tamed. It is neither caressing nor familiar; when frightened it utters harsh cries, softer ones when its food is brought, but *crag, crag, craag*, at the same time raising its head, is the expression of its joy or triumph.'

Coracias garrula.

The *Mino Bird*, *Gracula religiosa*, Linn., *Bëo* and *Mencho* of the Javanese, *Teeong* of the Sumatrans, will find a more appropriate place among the *Sturnidæ*, according to Mr. Swainson. Mr. G. R. Gray arranges it under the family *Corvidæ*, in the subfamily *Graculinæ*. Mr. Swainson states that analysis has convinced him that neither the *Rollers* nor the bird in question belong to the *Corvidæ*; and he remarks that the little value that can be attached to speculations on the rank of the present genera founded upon mere synthesis, will best appear by looking to those artificial arrangements that place the short-legged Rollers close to the long-legged and powerfully constructed Grakle (Gracula religiosa).

M. Lesson, as we have seen, places this bird next to the Rollers, and among the *Eurystomidæ*, and though we are by no means satisfied that this is its proper position, we shall, in the present state of opinion, notice the form here.

The *Gracula religiosa* then, the type of Cuvier *Eulabes*, formed, says M. Lesson, the genus *Mai* Brisson, and was placed by Linnæus and Gmelin an *Graculæ*, next after the Orioles. M. Temminck the genus *Gracula*, reduced to the Mino Bird alone his omnivorous birds, and M. Vieillot kept it also, a it in his family of *Caronculés*.

Generic Character.—Bill short, stout, not so lo head; entirely compressed. Frontal feathers a far upon the base, but not dividing the front. gradually curved from the base to the tip, tinctly notched. Commissure but slightly an der mandible with the base broad and dilat basal, naked, round, sunk in a depression. F short, velvety. Head with naked wattles. *Pastor*. Tail short, even. Feet rather short, Tarsus and middle toe equal; hinder toe shorter; almost equal to the outer toe. (Sw.)

Example, *Gracula religiosa*.

Description.—Deep velvety black; a white space middle of the wing; bill and feet yellow; behind spring fleshy caruncles of a bright orange-colour, and beyond the occiput.

Geographical Distribution.—Java, Sumatra, great Eastern Islands.

Habits, Food, &c.—Insects and fruits form the foo Mino-Bird, which is easily tamed, and learns to wh talk with great facility. With the natives it is favourite in consequence. Marsden says of it, tha the faculty of imitating human speech in greater pe than any other of the feathered tribe. Bontius, wh it *Pica, seu potius Sturnus Indicus*, heads the chapte he figures and describes it with the following lines:-

> 'Psittacus Eois quamvis tibi missus ab oris
> Jussa loquar: vincit me Sturnus garrulus Indus.'—

And tells the following story:—There was, when h Batavia, an old Javanese woman, the servant of a gardener, who kept one of these birds which was ver cious. Bontius was very anxious to buy it: but thi woman would not hear of. He then begged that sh at least lend it to him that its picture might be take quest which was at last granted with no very good g antient Mohammedan dame being under great ap sion that Bontius would offer that abomination, por beloved bird. This he promised not to do, and had of the Mino, which kept continually saying *Orang N Catjor Macan Babi*. This being interpreted, means tian Dog, Eater of Pork:' and Bontius came to the sion that the unwillingness of the old woman arose from the fear of her bird being desecrated by an swine's flesh, but also from the apprehension tha his servants, irritated by its contumelies, would w neck. M. Lesson also saw one at Java which kne phrases of the Malay language.

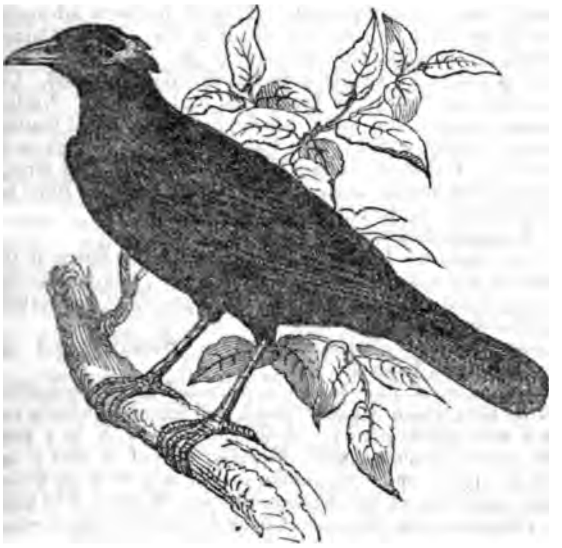
The general opinion seems to be that there is species of Mino Bird.

Gracula religiosa. (Eulabes Javanus, Vieill.)

Cuvier however states that Linnæus e

species under the name of *Gracula religiosa*, viz. *Eulabes Indicus* and *Eulabes Javanus*.

M. Lesson, who states that only one species is known, viz. the *Mainate Religieux*, *Gracula religiosa*, Linn., *Bëo* and *Mencho* of the Javanese, remarks afterwards that there is said to be a smaller variety: this is probably the *Eulabes Indicus* above noticed.



Eulabes Indicus.

The last-mentioned ornithologist applies the old Indian word *Mino* as a generic term for a very different bird, *Mino Dumontii*, described by him in *The Zoology of the Coquille*, and there figured at pl. 26. He is also of opinion that *Gracula calva*, Linn., should be added to this genus.

ROLLIN, CHARLES, born at Paris, January 30, 1661, was the second son of a master cutler, and was intended by his father for the same trade. Attracting the notice of a Benedictine monk, by the taste and aptitude for learning which he showed at a very early age, he was rescued from his obscure destiny, and placed at the college of Plessis with a pension. Here he pursued his studies with great zeal, industry, and docility, was much noticed by the Principal of the college, and was selected by the minister Le Peletier as the companion of his two sons, with whom he had disputed the prize of academic distinction in generous rivalship. After having been instructed in humanities and philosophy, he devoted three years to the study of theology at the Sorbonne. At the age of twenty-two he had distinguished himself so much in the college of Plessis, that Hersan, the professor of rhetoric there, pointed him out as his own successor in the professorial chair, which he wished to vacate, and Rollin, in spite of his own diffidence, was made his assistant in 1683, and professor in his stead in 1687. The next year he received the additional honour of the professorship of eloquence in the Royal College. In both these capacities he did not disappoint expectation. The orations which he delivered in public were very correct and elegant Latin compositions; and the reforms and regulations introduced by him into the discipline of the university deserve much praise. He revived the study of Greek, which had been greatly neglected, gave more prominence to the culti- the French language in the course of general in- introduced the plan of learning by heart fine s of different authors, as an exercise of taste and y, and substituted exercises in the room of the dra- representations which the scholars had been in the of performing. In 1694 he was appointed rector of the university, in which office he continued two years, and made himself remarkable not less for his constant attention to its internal management than for his zeal in maintaining its privileges against all attempts to impair them.

At the expiration of the rectorship, he was engaged by Cardinal Noailles to superintend the studies of his nephews, having resigned all his public employments, except the professorship of eloquence in the Royal College, in order that he might have more leisure for his private literary labours. Shortly after he was dragged from his retirement, and unwillingly persuaded to become coadjutor in the college of Beauvais. In this situation he passed fifteen years, devoting himself with as much assiduity to the improvement of the system of education there, as he had before done in the college of Plessis. In consequence of the disputes between the Jesuits and Jansenists, which latter party he was thought to favour, and the intrigues thence arising in his college, Rollin was compelled to quit his office at Beauvais. In 1715 he published his edition of Quintilian, in two volumes, 12mo., with a preface and a popular outline of rhetoric, short notes, and summaries of the chapters. The text was not published entire, but selections were made according to the judgment of the editor.

In 1720 he was again chosen rector of the university, but in consequence of the religious feuds already mentioned, he was displaced very shortly by a lettre-de-cachet, the university being desired to choose a more moderate rector. From this period till his death he seems to have withdrawn from public life as much as possible, and devoted himself to study, the fruit of which was given to the world in several works. In 1726 appeared his 'Traité de la Manière d'Etudier et d'Enseigner les Belles-Lettres,' a work which presents a popular view of such classical and French literature as he considered suited for the instruction of the young, and contains such a system of education as his own experience in teaching had suggested. This treatise, though deficient in philosophical principles, and inferior to subsequent writings of the same nature, was well adapted for the age in which it was published, and contributed probably very much to diffuse a general taste for literature throughout France. It was translated into English, in 1735, under the title of 'Thoughts concerning Education, translated from the French.' There is extant a letter from Bishop Atterbury to Rollin, in which he speaks in high terms of it. Encouraged by the general approbation with which this publication was received, Rollin composed his 'Histoire Ancienne,' an account of the chief nations of antiquity drawn from profane authors, and terminating with the establishment of the Roman empire under Augustus, in thirteen volumes, which appeared successively in the interval between 1730 and 1738. His last work was a history of Rome, which was afterwards continued by Crevier, from the end of the republic to the time of Constantine, in completion of the original plan.

Rollin's latter years were disturbed occasionally by the religious troubles which agitated his country. His friendship with many distinguished Jansenists drew upon him from time to time the suspicions of the government, and he was accused of joining in conspiracies, and his house searched in consequence, though his enemies could not succeed in criminating him. He died 14th September, 1741, having exceeded his eightieth year.

From the testimony of his contemporaries it appears that Rollin's character was a model of piety and virtue. He was remarkable for his liberality, modesty, integrity, and single-heartedness. This last quality is shown not less in the whole tenour of his actions than in his writings, which please more from a certain simplicity than from any other cause. The merits and defects of his 'Belles-Lettres' are of the same kind as those observable in his 'Histoire Ancienne.' There is the same want of profound thought, and the same absence of critical judgment, the same easy style, attractive to a young mind, and pleasing from its very carelessness, while the want of critical judgment is compensated by the love of truth and the morality which pervade the whole.

Great praise has been bestowed on Rollin by his contemporary admirers, among the most illustrious of whom were the duke of Cumberland and Frederic the Great, who was his frequent correspondent. Montesquieu styled him 'the bee of France,' and Voltaire and Rosseau have confirmed this eulogium.

Modern readers will perhaps think that Rollin's merits as an author have been overrated by the zeal of personal friendship and esteem for his private character, and that his works are chiefly valuable as having contributed to form the taste and strengthen the moral feelings of his age. His 'Opuscules' were collected and published, 2 vols. 12mo., in 1771; they contain orations and poems, written in very classical and graceful Latin, correspondence with Frederic the Great, Rousseau, and other distinguished persons, and other smaller compositions.

Extracts from his works, by M. l'Abbé Lucet, were published in 8vo., Paris, 1780, under the title of 'Pensées sur plusieurs points importans de Littérature, de Politique, et de Religion.' He is said to have written a 'History of the Arts and Sciences of the Antients,' London, 1768, 3 vols. 8vo. His 'Histoire Ancienne' has frequently been reprinted. A new edition of all his works was commenced at Paris, 8vo., 1837. This history was edited by Emile Beres, with new maps and plates.

The materials for a biography of Rollin are contained in the 'Eloge de M. Rollin,' written by M. de Boye, secretary of the Académie des Inscriptions (of which Rollin was a member), and read before this Society, 14th November, 1741. It was printed, with additional matter in the form of notes, in the edition of the 'Opuscules,' in 1771, already referred to. See also Chaufepié's 'Dictionnaire Historique' and the 'Biographie Universelle.'

ROLLO. [Normandie.]

ROLLS. [Records.]

ROLLS-COURT, the Court of the Master of the Rolls, of which there are two, one at Westminster in the new buildings adjoining the hall, the other in the Rolls Buildings in Chancery Lane. The latter was originally a house or hospital for the reception of Jewish converts: but when the Jews were banished from England by King Edward I., there was little use for an hospital of this kind: whereupon it was assigned to the Master of the Rolls, who had thenceforth the denomination of *Magister Rotulorum, Recordorum, &c., et Custos Domus Conversorum*. One or two converts were maintained on a poor pittance in this house in the sixteenth century.

ROLLS, MASTER OF THE, a very eminent officer of the Court of Chancery, second only to the chancellor himself. Originally he had, as the name implies, the custody of the rolls or recorded proceedings of that court, and, it seems also, of any other documentary matter belonging to that court. But the custody had long been merely nominal, the actual care of them being vested in certain keepers, who were not even appointed by the Master of the Rolls: the two chief depositaries being at the Tower, where the records previous to the reign of Richard III., and at the Rolls Buildings, where are kept those of the later period. But this state of things was altered by the act 1 and 2 Victoria, chap. 94, entitled an 'Act for the better custody of the Public Records,' by which the custody is restored to the Master of the Rolls for the time being, and very extensive powers are given to him with respect to the custody and use of them. The act further commits to him the records also of the Common-Law Courts and of the Court of Exchequer.

By what means the Master of the Rolls became divested of the peculiar duties indicated by the name, is a point of legal antiquarianism which has not been satisfactorily elucidated; nor is it quite clear when or how he came to sit to hear causes in equity. Now the chief duties of this officer are judicial; but from his decrees there is an appeal to the chancellor. He signs all injunctions of the Court of Chancery.

ROMA, COMARCA DI, is the name of a province of the Papal state, in which the city of Rome is situated, and which is under the same administrative authorities as the metropolis itself. It consists of the Agro Romano, or territory immediately around Rome, and of the districts of Tivoli, Albano, and Subiaco. The province extends on both banks of the Tiber, including Bracciano, Monte Rosi, and Monte Sant' Oreste (the antient Soracte) on the west or right bank of the river, and it extends as far as Magliano on the eastern or left bank, including Palombara, Tivoli, Vicovaro, and the whole valley of the Anio, with Palestrina, Frascati, Albano Genzano, and Porto d'Anzo and Nettuno on the sea-coast. It is bounded on the north by the province of Spoleto e Rièti, on the east by the kingdom of Naples, on the south by the province of Frosinone, south-west by the Mediterranean, and west by the province of Viterbo. The city of Velletri forms a separate government under the Cardinal Decano, or senior cardinal, who is by custom legate of Velletri and Ostia. For a description of the Comarca see Campagna di Roma.

ROMAGNA, ROMANDIO'LA, a name which was given in the middle ages to a tract of country north of the Apennines, extending along the coast of the Adriatic, from the river Foglia near Pesaro, which was the northern boundary of the Picenum, or March of Ancona, to the Scoltenna, or Panaro, which flows half way between Bologna and Modena. This extent of territory corresponds to that of the modern Papal legations, Bologna, Ravenna, Ferrara, and Forli. The Po was its boundary on the north, and the Apennines of Tuscany on the south and west. Ravenna was the chief town. The name of Romagna, or rather Romandiola, 'Little Rome,' is said by Alberti to have been given to it in consequence of the Exarchs having fixed their residence at Ravenna, which thereby became a second Rome, being the seat of the Imperial government in Italy. But the appellation came into common use later than the period of the Exarchs, for in their time the old administrative names of the time of the empire, 'Flaminia' and 'Æmilia,' were still in use. (Paulus Diaconus, *Hist. of the Longobards*, ii. 19.) In the quarrels between the popes and the Greek emperors on the subject of images, the people of Ravenna and the neighbouring country took part with the former, and afterwards Pepin and Charlemagne bestowed Æmilia, Flaminia, and Pentapolis on the see of Rome, and although the popes could not for a long time after enforce their political supremacy over the whole of that country [Papal State], still they considered it as their own, and gave it the name of Romandiola. Such is the account of Giannone and other historians. During the middle ages several popes strove to maintain their authority over the petty princes and towns among which the country was divided. [Albornoz.] Alexander VI. commissioned his son Cesare Borgia to conquer the country, which he effected in great measure, partly by force and partly by treachery, and the pope created him duke of Romandiola; but after the death of Alexander VI., Julius II. annexed it to the Papal state. The country was afterwards divided into administrative divisions styled legations, but the general appellation of Romagna continued in use, being applied more especially to the eastern part of the country near the Adriatic, between Rimini and Ravenna, the inhabitants of which are called at Rome to this day 'Romagnoli.' The people of Bologna and Ferrara are not understood as included in this denomination. The Romagnoli are lively and quick, but they have the character of being hasty and violent. Of late years they, as well as their neighbours of Bologna, have shown themselves the most impatient of Papal control of all the populations of the Papal State. The principal towns of Romagna are: Cesena; Faenza; Forli; Imola; Ravenna.

ROMAGNO'SI, GIAN DOME'NICO, born near Piacenza in 1761, studied first in the College Alberoni, where he had for a schoolfellow his countryman Gioia, who afterwards distinguished himself as a publicist and a political economist. [Gioia, Melchiorre.] Romagnosi continued his studies at Parma, where he took his degree of Doctor of Law in 1786. He afterwards practised as an advocate. In 1791 he published his 'Genesi del Diretto Penale,' being an investigation of the grounds on which the infliction of punishment for offences is founded. Beccaria, Filangieri, and other Italian jurists of that age had adopted the French theory of a social contract, by which each member of incipient societies was supposed to have given up a portion of his original independence into the hands of the collective body, and to have thus bound himself and his descendants. Romagnosi rejected this hypothesis, and he derived what he called the right of punishing from the principle of necessity and of self-defence, inasmuch as the whole of society is concerned in an injury which is done to any of its members. His work was well received in France and Germany; but it has been little noticed in Italy until of late years, where it has been republished five or six times; and it is now much studied, especially in Tuscany. Soon after the publication of the work, the prince bishop of Trent named him prætor, or chief magistrate, of that town, an office held for one year, but in which Romagnosi was confirmed for three consecutive years, after which the bishop named him his aulic councillor.

During the turmoil of the French revolution, Romagnosi did not participate in the blind admiration of many of his countrymen for what were called the new ideas, and he tried to define the just meaning of liberty and equality in two little works, 'Che Cosa è Eguaglianza,' 'Che Cosa è Libertà,' 1793. When the French invaded Italy in 1796, Romagnosi remained in the Italian Tyrol, to whose population he was greatly attached: he said of them, among other things, that they did not know how to tell a lie. When the French entered the Tyrol, Romagnosi was named secretary of the provisional council instituted at Trent, in which capacity he did all he could to alleviate the evils of foreign invasion e French were driven away in 1799, he was accused Invidious person of disaffection to his legitimate ı, and was arrested and confined at Innsprück; but oon released, and the emperor Francis himself dem innocent, and banished his accuser. In Decem- 2, he was appointed professor of law in the uni- ' Parma, where he published his second professional ntroduzione allo Studio del Diritto Pubblico Uni- a treatise on general jurisprudence, or what has ed by Hobbes 'civil philosophy,' and by Barbeyrac lamaqui, 'droit naturel,' or 'law of nature.' Ro- maintained that moral and political science is as de of demonstration as the natural and metaphysical

He took for the basis of his system the principle of cessity, saying that man and society tend not only preservation, but to their physical and moral im- nt, in the quickest and at the same time safest ion. This progression can only be effected by the intellectual and moral powers. The under- and the heart ought to be educated so as to create hes and habits consistent with the general welfare, at utility and justice shall coincide.

nd edition of Romagnosi's work appeared at Milan with the addition of five letters by the author to r Valeri of Siena, in which he develops and illus- s principles.

6 Romagnosi was requested by the government of alled kingdom of Italy, then under Napoleon, to Milan, in order to assist other distinguished jurists iling a code of criminal procedure. Romagnosi all the sittings of the Commission in which the of the new code was discussed. He wished to the jury; but Napoleon put his veto on it, saying lid not think that the state of Italy allowed of such ution. Some one proposed to introduce into Italy res-de-cachet,' or royal orders for imprisoning indi- for state reasons without trial, which existed in nder Napoleon, as well as under the old monarchy; iosi strenuously opposed the measure. Per- coldness among his colleagues on the subject, them that the crosses and decorations which they heir breasts produced on them the effect of Medusa's nally he carried his point. He had also the merit lucing into the code the heads 'rehabilitation' and of trials.' The code, as revised by Romagnosi colleagues, was adopted, and published under the title, 'Codice di Procedura Penale del Regno 8vo., Brescia, 1807. In France it was praised by ères. The suggestions of Romagnosi during the n of the code were published separately under the time e più necessarie Aggiunte e Riforme al Progetto ce di Procedura Penale,' Milano, 1806.

iosi was likewise employed in the compilation of code for the kingdom of Italy, which however never law. In consequence of the numerous revisions it was subjected, and the dilatoriness of the Italian s, the project had not reached Paris when Napoleon r it. Finding that it was not ready, with his cha- ic impatience he ordered the French penal code to with translated purely and simply, and enforced in the great regret of the Italians, who complained of trary and perverse character of many of the French l laws, which are decidedly the worst portion of the law of France. [CODES, LES CINQ.] The proposed code was conceived in a very different spirit: it was together with the discussions which it had elicited, olumes, 8vo.: 'Collezione dei Travagli sul Codice del Regno d'Italia,' Brescia, 1807. These particulars al for enabling us to understand the history of those the true character of Napoleon's legislation and ration.

07 Romagnosi was appointed professor of civil the university of Pavia, and in 1809 he was recalled to lecture on legislative science, in order to form f academy of advocates and magistrates. As part cheme, he published his 'Discorso sul Soggetto ed nza dello Studio dell' alta Legislazione,' Milan, 1812; 'Principii fondamentali di Diritto Amministrativo,' his lectures he compiled, in 1820, his 'Assunto Scienza del Diritto Naturale,' which may be as a continuation of his 'Introduzione al Piritto Universale' mentioned above. He demonstrates is the natural state of man, from which all his rights and duties are derived; that agriculture, arts and commerce, education and instruction, and religion, are necessary to the social state; and that knowledge, will, and power are the three conditions required for its improvement. On being appointed inspector of the schools of law in the kingdom, he laid down the principle, that candidates for professorships ought to be examined more especially on the system of teaching which they propose to follow, even more than on the subject-matter of their lessons; he insisted, in short, on the importance of pedagogical science and aptitude.

His 'Saggio filosofico-politico sull' Istruzione Pubblica Legale,' Milan, 1807, belongs to this period. He had previously written a 'Progetto di Regolamento degli Studj Politici Legali.' He also edited a 'Journal of Civil and Administrative Jurisprudence.'

When Napoleon's power was overthrown in 1814, Romagnosi lost his offices, but he continued to lecture on jurisprudence till September, 1817, when the special chairs at Milan were suppressed. He continued however to teach privately at Milan. In June, 1821, during the political agitation of that period, he was summoned to Venice to be tried on a charge of high treason, of which however he was fully acquitted in December of the same year, and the emperor confirmed the sentence of the court in words most honourable to Romagnosi.

He still continued to live at Milan, teaching, and writing for several journals, and especially for the 'Annali di Statistica,' to which he was one of the chief contributors. He wrote also on matters of law, especially on the important subject of property in water, and water-ways and channels for irrigation, questions of the utmost importance to Lombardy: 'Della Condotta delle Acque secondo le vecchie, intermedie, e vigenti Legislazioni dei diversi Paesi d' Italia,' Milan, 1822-5, six volumes, with an appendix in two volumes. This work was very well received, not only in Italy, but also in Holland. A second work by Romagnosi on the same subject is entitled 'Della Ragione Civile delle Acque nella Rurale Economia,' two vols., Milan, 1829-30.

He also began a 'Dizionario Ragionato delle più importanti Parole della Giurisprudenza Romana, Francese, ed Austriaca,' but the work was not continued. His work entitled 'Dell' Indole e dei Fattori dell' Incivilimento con Esempio del suo Risorgimento in Italia,' contains a brief sketch of the progress of human civilization through different ages, a subject which Herder has more fully and elaborately treated in his 'Philosophy of the History of Mankind' (*Ideen zur Philosophie der Geschichte der Menschheit*). Long before Romagnosi, the Neapolitan jurist Gianbattista Vico, in his 'Principii di una Nuova Scienza,' and Jacopo Stellini, a native of Friuli, in his remarkable work, 'De Ortu et Progressu Morum,' had laboured in the same field, but their works have scarcely been noticed. Romagnosi had the merit of rendering their inquiries and his own, on the vast subject of the progress of civilization, familiar to the Italian readers.

The other works of Romagnosi are: 1, 'Che Cos' è la Mente Sana?' Milan, 1827; 2, 'Della Suprema Economia dell' Umano Sapere in relazione alla Mente Sana,' Milan, 1828; 3, 'Dell' Insignamento primitivo delle Matematiche;' 4, 'L'antica Morale Filosofia;' 5, 'Elogio storico di Melchiorre Gioia;' 7, 'Elogio del Cardinale Alberoni;' 8, 'Note, Supplementi, ed Illustrazioni all' India Antica di Robertson.' He left several works in MS., among others: 1, Della vita degli stati;' 2, 'Della Civile Filosofia in relazione alla Vita degli Stati;' 3, 'Ricerche sù la Validità dei Giudizii del Pubblico à discernere il Vero dal Falso.'

Romagnosi was no dreamer. In an age of confusion of ideas, he retained his mental self-possession, and was not led away by crude theories, nor was he entrammelled by any superstitious veneration for irrational though antient custom. He was an original thinker, and as such not justly appreciated in his life-time; but he is now remembered as an able supporter and expounder of sound political principles. Some of the most distinguished living writers of that country, Rossi, Cantù, and others, boast of having been his disciples. Romagnosi was a member of the Italian Academy, of the Academy of the Georgofili, of the French Institute for the class of moral sciences, and of other learned societies. He died at Milan, in June, 1835. His funeral was attended by more than two hundred of the most distinguished men of that capital, who felt the value of departed merit, and who subscribed on the spot to raise a monument to his memory. (*Notizia di G. D. Romagnosi, stesa da Cesare Cantù*, Milan, 1835.)

ROMAINE, WILLIAM, was born at Hartlepool, in Durham, on the 25th of September, 1714. His father was one of the French Protestants who fled to England upon the revocation of the Edict of Nantes, and a man of the strictest piety and integrity. Mr. Romaine was his second son. He was educated at the grammar-school of Houghton-le-Spring, in the county of Durham, whence he proceeded to Oxford in 1730 or 1731, and entered first at Hertford College, and afterwards at Christchurch. He resided principally at Oxford, devoting himself especially to the study of the Hebrew and Greek Scriptures, till he took his degree of M.A. in 1737. He had received deacon's orders the year before. His first curacy was that of Loe Trenchard, in Devon, which he served for six months. In 1738 we find him residing at Epsom, in Surrey, and about the same time that he received priest's orders from Dr. Hoadly, bishop of Winchester, he became curate of the parishes of Banstead and Horton, in Middlesex. At Banstead he became acquainted with Sir Daniel Lambert, who, on his election to the mayoralty of London in 1741, appointed Mr. Romaine as his chaplain. In this capacity he preached a sermon at St. Paul's, on *Romans* ii., 14, 15. This was the second sermon he published, the first having been one which he preached before the university of Oxford in 1739, entitled 'The Divine Legation of Moses demonstrated, from his having made express mention of, and insisted so much on, the Doctrine of a Future State; whereby Mr. Warburton's Attempt to prove the Divine Legation of Moses from the Omission of a Future State is proved to be absurd and destructive of all Revelation.' At the end of the year 1741, he returned to the attack on Warburton's theory, in a sermon preached at St. Mary's, Oxford, having in the mean time been engaged in an epistolary controversy with Warburton. The next seven years of his life were devoted to the preparation of a new edition of Calasio's Hebrew Concordance and Lexicon, which was published in 1747. He discharged his office as editor of this work most faithfully. He was chosen lecturer of St. George's, Botolph-lane, and St. Botolph's, Billingsgate, in the year 1748. In the following year he was elected to two lectureships at St. Dunstan's in the West, the duties of which he had discharged for some time, when the rector thought fit to deny him the use of the pulpit. The matter was referred to the Court of King's Bench, which deprived Romaine of one of the lectureships, but confirmed him in the other, with a salary of eighteen pounds a year; but he was still refused the use of lights in the church, and used to preach by the light of a single candle held in his own hand, till this unseemly contest was put an end to by the mediation of Dr. Terrick, the then bishop of London. This lectureship was held by Romaine till his death. In 1750 he was appointed assistant morning preacher at St. George's, Hanover-square. He held this office till September, 1755, when he was removed from it, his biographer tells us, on account of 'the popularity and plainness of his ministry.' About the time of his appointment to this lectureship, he was chosen professor of astronomy in Gresham College. His views of natural science were Hutchinsonian, and he always expressed his opinions with boldness, and not always without bigotry. Accordingly he spoke of the Newtonian views as having 'a difference in their demonstrations of no less than one hundred and twenty-one millions of miles,' and of 'the modern divinity as bringing you no nearer than one hundred and twenty-one millions of miles short of heaven.' It is not surprising that he gained little reputation from this office. He seems however to have regained his credit with the citizens by his opposition to the bill for naturalizing the Jews in 1753.

In February, 1755, he married Miss Price; and in the following year he became curate and morning preacher at St. Olave's, Southwark, where he remained till 1759. During this period he resided in a pleasant retreat in Walnut-tree Walk, Lambeth, where he was in the habit of inviting young clergymen to his early breakfasts, and many have spoken with great gratitude of the instruction and encouragement they received from him.

Romaine had frequently preached before the university of Oxford up to the year 1757, when he was refused the use of the University pulpit, in consequence of the offence which was taken at a sermon he delivered there on 'the Lord our Righteousness.' This sermon he published in vindication of his conduct. In the same year he published a t
dressed to members of the Established Church,
them to set apart one hour in every week for pray
half of the church and nation.

About this time he received pressing invitatio
ministry of a church in Philadelphia, which Mr.
strongly urged him to accept, but he preferred re
his own country.

In 1764 he was chosen to the rectory of St. A
the Wardrobe, and St. Ann's, Blackfriars. His
was disputed, but in 1766 it was confirmed by the
Chancery. He spent the rest of his life in the fai
zealous discharge of the duties of this office. He
26th, 1795, and was buried in the rectory vault of Bl
Church, on the 3rd of August.

Romaine has been compared to a 'diamond, rou
but very pointed, and the more he was broken by
more he appeared to shine.' His firm attachmen
he esteemed truth was not always tempered with m
towards his opponents, and sometimes, if we are
anecdotes that are told of him, his bold impet
trayed him into acts of rudeness, for which ho
always apologised with Christian humility. His de
in private life was mild and amiable, and he was
emplary in his domestic relations. He was espe
markable for the diligence and regularity with
improved his time. His religious sentiments were
Calvinistic, and he spent his life in boldly maintain
in an age when such a course was sure to excite vi
position and to shut out all hopes of preferment.
his whole life he continued strongly attached to th
of England. His chief works, in addition to thos
mentioned, are the following:—'Nine Sermon
107th Psalm,' 1747; 'A seasonable Antidote
Popery, in a Dialogue upon Justification,' 1757;
Sermons upon Solomon's Song,' 1759; 'Twelve
upon the Law and the Gospel,' 1760; 'The Life
1763; 'The Scriptural Doctrine of the Sacrame
Lord's Supper briefly stated,' 1765; 'The Walk
2 vols, 1771; 'An Essay on Psalmody,' 1775; 'The
of Faith,' 1795; and some Sermons and Letters.
were published in 8 vols., in 1796, with a Life by
and Rev. William Bromley Cadogan, M.A., some
of whom is contained in 'The Life and Times of the
of Huntingdon,' vol. ii., chap. 49.

(The *Life* of Romaine, by Cadogan and by Haw
moir' in the *Evangelical Magazine* for November

ROMAN ARCHITECTURE. Of the Grecia
account has been given under CIVIL ARCHITEC
which article we refer for such information as is
for understanding the present one, which is to be c
as supplementary to the other.

With regard merely to the orders, Roman arc
presents chiefly a corruption of the Doric and Io
may claim the Corinthian as almost entirely its
Roman examples of that order being not only
and varied, but at the same time exceedingly
in character from the almost solitary specimen of
foliaged capitals which occurs in a Grecian buildi
even as regards the application of the orders, there
difference between the two styles; in the Roman
frequently employed as mere decoration, the colu
engaged or attached to the walls, or in some case
of triumphal arches) though the columns are insu
advanced from the structure, they are in a manner
from it, inasmuch as they do not support its gen
blature, but merely projecting portions of it.
these the only differences, for besides the frequen
ment of pilasters as substitutes for columns—that i
stituting the order without columns—the practice
columniation, or raising one order upon another,
means uncommon; a practice that was indeed a
necessity in such enormous edifices as the Colosse
lumns were to be employed at all. From all this
evident that, as regards the orders alone, there
marked difference between Roman and Grecian
ture; yet such difference is by no means th
the two styles being almost opposites in nea
respect. If there were no other distinction betwe
that arising from the arch, and diverse applicati
principles to vaults and domes, would be a very
one; but we also meet with a variety and com
Roman buildings which does not occur in those o

stance that we are acquainted with in Grecian
, of anything like grouping or combination of
that of the Erechtheion, or triple temple on the
f Athens. With this exception, Greek temples
iple parallelograms, differing from each other
in the number and disposition of the columns
cella [Civil Architecture, p. 221]; conse-
ever beautiful when considered separately, a
notony prevailed in that class of buildings, at
the forms were so limited and fixed as to pre-
fresh combinations, or anything approaching to
lerstood by composition.
doption of the circular form in their plans, whe-
whole or parts of a building, the Romans intro-
mportant element of variety into architectural
pecially when we consider that to such shape in
plan is to be ascribed the origin of the *tholus*, or
ne, which harmonizes so beautifully with all the
enders the rotunda-shape at once the most pic-
d the most complete for internal effect,—that in
unity and variety are thoroughly combined. The
lone [Pantheon] would suffice to convince us
ins were not mere copyists, and that if as
orated the Greek orders, they also added
e art, and greatly extended its powers by new
As regards its exterior, the Pantheon presents
ainly a strikingly picturesque (and what we con-
lso a consistent and appropriate, because a well-
mbination, namely, of a rectangular mass pro-
n a larger circular one. In that example the
edifice, or rotunda itself, has no columns exter-
circular peristylar temples, or rotundas, whose
nclosed by an external colonnade, were not un-
f this kind is the temple of the Sibyl, or, as it is
lled, that of Vesta, at Tivoli, an edifice of sin-
v, and highly interesting as a very peculiar and
le of the Corinthian order, the first application
y modern building was made by Soane, at the
land. Edifices of this kind were covered with
s, or with smaller sections of a sphere,
did not show themselves much exter-
y were raised only over the *cella*, and therefore
part was concealed by the colonnade projecting
The dome of the Pantheon is hemispherical
is of very low proportions and flattened form
its spring commences at about the level of the
cornice of the exterior cylinder, and is further
e base of the outer portion of the dome being
nd formed into separate cylindrical courses or
he dome had sprung immediately from the upper
as to present a perfect hemisphere on the out-
nda itself would have looked merely as a *tam-*
d the effect would have been as preposterous as
of St. Paul's and the colonnaded rotunda on
ised were placed immediately on the ground, in-
g elevated upon a larger pile of building.
l forms of plan were sometimes employed, of
is an instance in what is called the temple of
dica at Rome, which is circular on the exterior,
ly decagonal, with nine of its sides occupied by
esses, and the other by the doorway—a remark-
ty, it being very unusual to enclose a polygon
drical structure, although not the contrary, nor
ylinder upon a square or polygonal basement.
ns were by no means uncommon: such form
tly made use of for the saloons of public baths;
an instance of an octagonal temple, supposed to
icated to Jupiter, in one of the courts of Dio-
e at Spalatro. Of hexagonal structures we
ted with no example, but a court with six sides
e remains of the temple of Baalbec, not however
xagon, but of elongated figure, two of the sides
and the remaining four 88 feet each. In the
of Roman architecture, circular and polygonal
became more frequent, and those of the first-
kind deviated considerably from the original
and circular temples. An inner peristyle
introduced so as to make a spacious circular
ulatory around the centre, which was
e colonnade, being covered by a dome
ical wall over the columns. What is now
tundo, at Rome, supposed by some to
y a temple dedicated first to Faunus, and

afterwards to the emperor Claudius, and by others to have been a public market, is a structure planned according to the arrangement just mentioned, with a circular Ionic colonnade of twenty columns and two piers. The Church of Santa Costanza, traditionally reported to have been a temple of Bacchus, but now generally supposed to have been erected by Constantine as a baptistery, and afterwards converted by him into a funeral chapel to his daughter Constantia, is a remarkable example, owing to the columns being not only coupled, but unusually disposed, and to there being arches springing from their entablature, that is, there are twenty-four columns (with composite capitals) placed in pairs, on the radii of the plan, or one behind the other, forming twelve inter-columns and as many arches; and as far as the mere arrangement goes, this interior is strikingly picturesque; but it would be an improvement, if the dome were in such case to spring immediately from the imposts of the arches, and the latter to groin into it; or at least were it to spring from the vertex of the arches.

The circular form was a favourite one with the Romans for their sepulchral structures of a more pretending class than ordinary. It will be sufficient here merely to mention those in honour of Augustus and Hadrian, an account of which has been given under Mausoleum. The tomb of Cæcilia Metella is a low cylinder, the height being only 62 feet, while the diameter is 90; and it may be considered as nearly solid, the chamber or cella being no more than 19 feet in diameter. This cylindrical mass is raised upon a square substructure; which combination of the two forms is productive of agreeable contrast; and it was accordingly frequently resorted to. The tomb of Plautius Sylvanus near Tivoli consists also of a short cylindrical superstructure on a square basement, but is otherwise of peculiar design, one side of that stereobate being carried up so as to form a sort of low screen or frontispiece, decorated with six half-columns, and five upright tablets with inscriptions, between them. The tomb of Munatius Plancus, at Gaeta, is a simple circular structure, of low proportions, the height not exceeding the diameter, and therefore hardly to be called a tower, notwithstanding that it is now popularly called Roland's or Orlando's Tower. Of quite different character and design from any of the preceding ones, is the antient Roman sepulchral monument at St. Remi, which consists of three stages; the first a square stereobate raised on gradini, and entirely covered on each side with sculptures in relief; the next is also square, with an attached fluted Corinthian angle, and an open arch on each side; and the uppermost is a Corinthian rotunda, forming an open or monopteral temple (i.e., without any cella), the centre of which is occupied by two statues.

As instances of other combinations, we may briefly refer to what is called the tomb of Virgil, near Naples, consisting of a square substructure surmounted by a conical one; to the Roman monument at Constantina, in Africa, conjectured to have been a cenotaph in honour of Constantine, the lower portion of which is a cylindrical structure surrounded by a peristyle of twenty-four Doric columns, and carried up as a lofty cone, in receding courses or gradini, leaving at its summit a platform for an equestrian statue.

These notices may serve to convey some idea of the variety aimed at by the Romans in the distribution of the plans and general masses of their edifices, independently of decoration. Their thermæ, or public baths, a class of structures remarkable for their vast extent and magnificence, are most interesting studies of combinations of plan; as they were not merely baths, but places of public resort and amusement, and consisted of an assemblage of courts, porticos, libraries, and spacious saloons and galleries, most of which presented some peculiarity of form and distribution. If therefore we estimate Roman architecture by the manifold resources which it opened to the art, rather than by its debasement of what it borrowed from that of Greece, we shall find much in it both to admire and to imitate, as well as to censure and reprove. Its Greek rival has nothing that will bear a parallel with it in this respect. Judging from its remains, we can see nothing in it that answers to the title of interior architecture; whereas some of the Roman temples were striking on account both of the size and the magnificence of their interiors. That of the Pantheon has been already referred to, and we shall now bestow some notice on two very singular examples of a different kind, viz. the Temple of Peace, erected by Vespasian, and the double one of

Venus and Roma, by Hadrian. Of neither of them however more than the mere ruins now remain, owing to which they have never been cited as examples of the orders. What was the external design of the first-mentioned temple is now altogether doubtful, but its interior is very remarkable, the plan being divided in its breadth into three nearly equal portions, the centre one of which formed a spacious nave, terminating in a large semicircular tribune, or apsis, covered by a semi-dome. This nave was disposed in three compartments, presenting as many arches of exceedingly wide proportions, opening into as many divisions of the lateral portions of the plan, which did not constitute continuous aisles along the nave, but small chapels or recesses. Of these the centre one on each side terminated, like the nave, in a semicircular tribune, of the same dimensions as that apsis, so as to form a transept, and give the whole a marked cruciform appearance. The side divisions were covered by semicircular vaults, concentric with the arches opening into the nave; and this latter had a vaulted roof, in three groins or compartments, the ribs of which sprung from eight Corinthian columns, placed against the piers of the arches. Besides other peculiarities, we have here an instance of the effect resulting from the application of the semicircular form to plans in interiors, and of further varieties of design arising out of it, for the semidomes of the tribunes exhibit a rich specimen of coffering, being composed of octagons and squares.

Assisted by the excavations made of late years in the Roman Forum, M. Caristie, a French architect, has given us a restoration of the temple of Venus and Roma, judging from which we may pronounce it to have been one of the most splendid edifices in the city. According to his plan of it, the temple stood in the centre of a quadrilateral enclosure, or peribolus, measuring 525 by 318 feet, and was enclosed by double colonnades of the Corinthian order, consisting altogether of 264 columns. The temple itself was of the same order, upon a considerably larger scale, and its dimensions about 350 by 166 feet. It was consequently large in proportion to the area within which it stood; and when viewed in combination with the extended files of columns around it, must have produced a powerful effect,—one in which harmony and regularity were blended with contrast. This main edifice was further remarkable as being not only decastyle, but pseudo-dipteral also, that is, the space between the columns and the walls of the cella was equal to two intercolumns and a column; accordingly the width of the cella corresponded with six columns and five intercolumns of the decastyle fronts. Each end elevation of the cella was therefore made a tetrastyle in antis to a pronaos or inner loggia; and these pronai, being of greater depth than the surrounding porticos, were vaulted hemicylindrically in a transverse direction, or from end to end, whereas the others were ceiled horizontally with beams and lacunaria. The cella was divided internally into two distinct halls, placed back to back, each of which was of nearly square proportions, but extended by a magnificent semicircular recess or tribune, containing a colossal sitting figure of the deity to which it was dedicated. Along each side were five tabernacle niches, with pediments alternately angular and segmental, and placed within the intercolumns of a small order, with statues upon its entablature, over each column. The ceiling was a richly coffered hemicylindrical vault, and the dome of the tribune was similarly decorated with coffers of a lozenge-form pattern. If we have dwelt somewhat at length upon this edifice, it is because we regard it as a very important example of Roman, as contradistinguished from Grecian architecture, and of that accumulated richness and pomp, together with that diversity of plan, which it affected. While they have noticed small and common-place temples, most writers have adverted but slightly, if at all, to other circumstances than those relating to their respective orders, as if architectural design was confined to or depended upon such matters alone, or as if they constituted the chief differences between the styles of Greece and Rome, and their respective application. By no means are we insensible to the refined taste displayed by the former, but neither are we to the grand compositions furnished us by the latter. Taking therefore the above temple according to Caristie's restoration of it, we agree with a writer who has said that it 'must have produced an effect perhaps unrivalled in sublimity by any work in the antient world:' for whether viewed from within the peribolus, or as seen through and towering above the open colonnades which formed that court, it must have been a varied and magnificent architectural scene.

The Romans seem to have affected the practice of grouping buildings together as features in one general symmetrical plan. Their temples and basilicas were frequently placed, as the principal architectural objects, at the extremity of a forum, or other regular area enclosed with colonnades. The temple of Nerva stood at one end of, and partly projected into an enclosure (measuring about 360 by 160 feet), the entrance end of which had five open arches, and the sides were formed by screen walls, decorated with Corinthian pilasters, and columns immediately before them, over which the entablature formed breaks. Of Trajan's forum, which was surrounded not only by colonnades, but various stately edifices, nothing now remains except the celebrated triumphal column that occupied its centre, and which, so placed as a principal object, must have heightened the splendour of the whole. Like that of Nerva, the temple of Antoninus and Faustina was placed at one end of a court of moderate dimensions, whose sides were adorned with coupled columns placed immediately against the walls; and only the portico part of the temple (a Corinthian hexastyle, triprostyle) [PORTICO] advanced into the enclosed area in front. The forum of Caracalla was nearly a square, entirely surrounded by arcades, presenting thirteen arches on each of the longer and eleven on each of the shorter sides. In the centre was a Corinthian temple very similar in plan to the Pantheon, with an hexastyle, triprostyle portico in front, and remarkable for having inner columns behind the second from each angle, so that there was a double range of them at each end, and the central space within the portico was a perfect square equal to three intercolumns. The notices we have incidentally made in regard to these temples may not improperly be followed by some additional remarks upon Roman edifices of that class. Unlike those of Greece, peripteral temples were of comparatively rare occurrence among the Romans: they were mostly prostyle, the portico being attached only in continuation of the cella, whose walls formed the flanks of the building, though the order of the portico was frequently continued along them either in half-columns or pilasters. Such is the plan of that celebrated one at Nismes, known by the name of the Maison Quarrée, which is a Corinthian hexastyle, pseudo-peripteral, the cella being ornamented with attached columns, thereby making ten intercolumns on each flank, three of which are open, or belong to the portico, which latter is accordingly *triprostyle.* The Corinthian temple at Assisi was similar in plan, except that it was not pseudo-peripteral, the sides of the cella being plain. That of Fortuna Virilis at Rome was an Ionic tetrastyle, diprostyle, and pseudo-peripteral. Besides contributing to variety, temples of this kind possess a certain variety of effect in themselves, owing to the depth of the portico, and the contrast between that part and the cella. The portico announced itself more decidedly as the façade *par excellence;* particularly as such temples were generally raised upon a stereobate continued as pedestals to enclose the steps leading up to them in front, and which sometimes, as in the temple of Nerva, and that of Antoninus and Faustina, projected very considerably. As our object is rather to direct attention to the modes of composition affected by the Romans and the elements of their style, than to describe their chief architectural monuments, either historically or according to their respective classes and destination, we proceed now to consider some of the individual peculiarities and features belonging to their buildings.

In the application of sculpture, particularly of statues, they were prodigal; but they employed the latter chiefly as architectural accessories, frequently placing them over columns, or on the summits of their edifices as acroters to pediments, by way of giving variety to the outline of their buildings, and also of indicating at first sight their particular appropriation—a practice almost unknown to the Greeks, there being only one instance of it. In Italian buildings, on the contrary, the practice has been frequently carried to a preposterous extent, rows of statues being placed on the pedestals of balustrades, so as almost to look like pinnacles, and to produce rather a stiff and formal effect than one of richness; whereas when they are introduced on the angles and apex of a pediment, or when there is merely one in the latter situation, such monotony does not take place, and additional importance and loftiness may be given to that portion of the edifice by such decoration. The

ıse of statues led to the adoption of the niche—
nknown in Greek architecture—as a convenient
nserting them within the surface of walls, and
corating them ; at the same time space was gained
where, if otherwise placed, they would have taken
Niches frequently occur in Roman temples and
d, as we have seen, from the account given of the
Venus and Roma, were occasionally decorated
ntispiece of small columns, with their entabla-
pediments, but were generally left plain, and
ıe most part semicircular in plan, in which case
ly terminated in an arch and semidome, after the
a tribune or large recess, of which the niche was
miniature copy. Niches however were very fre-
ectangular in plan, as were also exhedræ, or re-
which case the latter formed arches vaulted
drically.

arious applications of curvilinear forms, both in
elevation, undoubtedly furnished Roman architec-
urces unknown to that of Greece. Nor can
ıat the arch itself is a very beautiful feature,
ployed by the Romans to such excess as
notony than to contribute to variety of
r if neral character of Greek temples was
uniform, presenting in the exterior merely lines
s, the amphitheatres and similar works of the
onsisted only of continuous tiers of arches, which
d their more strongly marked features, the
eed against their tiers being merely ornamental
, and comparatively of little effect, and even that
very best kind. In either case—the Roman or
—a single compartment of an edifice, whether
colonnaded, serves as a pattern for the whole;
uniformity and continuity conduce to grandeur,
ly the same kind of uniformity recurs in every
the same class, it becomes wearisome. In this
othic architecture is far more favourably consti-
either Grecian or Roman, for it admits of infi-
of expression, where that of the general design
ar to other buildings. There was one class of
wever, which though consisting uniformly of
d piers alone, were eminently impresssive and
, namely, the Roman aqueducts, works of ex-
y grandeur, if estimated by their prodigious ex-
the colossal massiveness of their construction,
wise entitled to be termed magnificent, their
ing in the plainest and severest style. In
were sometimes two or even more tiers of arches,
only a single one, as in that at Metz on the
which has exceedingly lofty arches, or, to speak
ectly, arches on exceedingly lofty piers, divided by
o three stages, the effect of which is no less advan-
han it is uncommon.

come to consider a practice eventually adopted,
of which the arch and column became amalga-
integral parts of the same ordinance, viz. that
ting arches upon columns, making them spring
tly from their capitals or from an entablature-
k over them. We are aware that this practice
uniformly condemned as barbarous and absurd;
r opinion somewhat too hastily, and with more of
than of fair examination. That it was introduced
e decline of the art, and that it was an innovation
of former principles, is not to be denied. Yet if
reprobated, it ought to be so for its own demerits,
innovation; for all invention is such. It appears
oor argument against it, to say that columns
lly designed to support horizontal archi-
not see how that circumstance, of necessity,
ry other application inadmissible. At that rate
sure as vitious a great deal of both Roman and
itecture, where attached columns are employed
ornaments, yet, as frequently as not, in such man-
produce a character of littleness and poverty, they
ll in proportion to the rest as to appear insigni-
t such intervals from each other that all the
harmony of a columnar ordinance is lost. Where
employed to support, it certainly cannot be
they are idle unmeaning expletives; nor that
lated by being apparently partly embedded in
d them. 'A pier,' it has been remarked by
writer, 'is but a differently shaped and more
;' which being granted, what impropriety can there be in employing the latter as a substitute for the other, provided it be done with judgment and discretion, and where upon the whole it will prove an advantageous mode of treatment? It certainly is a barbarous mode to turn small arches upon columns, which are not more than between two and three diameters apart, of which we have examples in the basilica of S. Paolo, and Santa Agnese fuor delle Mura, at Rome. The intercolumns are such that they might easily have been closed horizontally; indeed the openings between the columns have scarcely the appearance of being arches; but the whole looks as if the wall resting upon the columns was scooped out into diminutive arches over the intercolumns. In those instances too the arches themselves are quite plain, without archivolt or mouldings of any kind, and consequently all keeping is destroyed; the architectural embellishment terminates with the capitals of the columns, and so far the effect is similar to what would be produced by placing a plain horizontal mass upon a range of columns, instead of a moulded entablature. Although one of an opposite kind, it it equally a fault to make the arches spring not immediately from the capitals of the columns, but from square fragments of entablature over them (as, for example, in the interior of St. Martin's, London) not only because such fragments are unmeaning in themselves, and suggest the idea of the columns having been found too short for their intended purpose, but because they remind us quite unnecessarily of the original application of the column to the horizontal entablature. If entablature be admissible at all, it is when the columns are coupled, as in the church of Costanza already noticed; for then some kind of architrave at least becomes requisite, in order to connect the two capitals, as it were, together. One very great advantage attending the combination of the arch with the column as its support, is that it allows the openings to be considerably wider than they otherwise could be, because such intervals as would produce a poor and straggling effect in a colonnade, become well proportioned and agreeable when spanned by arches. Such columnar arcades have frequently been employed by the Italians with happy effect in *cortili* and places of that kind, where piers of the usual kind would obstruct the view too much, and where intercolumns of the same proportions, between pillars supporting a horizontal entablature, would have a poor and disagreeable effect, particularly if, as is generally the case, other stories of the building rested upon the porticos below. In fact, ordinances composed of arches and pillars constitute the best specimens of Italian columnated architecture. That in the cortile of the Palazzo Piccolomini at Siena, the work of Francesco di Giorgio, is singularly beautiful in its distribution, remarkable for the richness of its details, and also for the variety which it presents in perspective, as may be judged from the view of it given in Grandjean and Famin's 'Architecture Toscane.' We have already mentioned the interior of St. Martin's as containing an example of arches upon columns, and that of St. Bride's, London, furnishes another, but neither is a favourable one. A more satisfactory example may be found within the loggia of the Strand portion of Somerset-house, where, though the arches spring from entablatures over the columns, yet as the latter are placed in pairs, those horizontal parts are more than mere upright blocks over the capitals. The quadrangle of the late Royal Exchange, London, had arches springing immediately from the capitals of the columns, but their breadth was excessive in proportion to the height of the latter, and their elliptical form was a great defect, and certainly did not at all contribute to beauty. All that we contend for is the principle on which the practice is founded; for as to the merits of the buildings in which it is adopted, that must, like everything else in architecture, depend upon the taste shown in the particular application of it, which may be exceedingly good or altogether the reverse. Hungerford-market affords a good example of an ordinance composed of columns and arches, and also an idea of the general character of a basilica, though of course somewhat modified, and without any sort of architectural luxury.

If we have dwelt somewhat at length upon this particular point, it is because we consider it rather an important one, were it merely as showing how what was introduced barbarously and ignorantly was afterwards refined into an ordinance or mode of composition not without elegance, frequently combining both that quality and picturesque effect in an eminent degree. In regard to the orders, we shall, on the contrary, be more concise than others, who have confined their notice of Roman architecture almost to them alone.

Of the two Grecian orders, the Roman specimens usually referred to, namely, the Doric of the theatre of Marcellus, and the Ionic of that building and the temple of Fortuna Virilis, are exceedingly poor and meagre, spiritless and tasteless; while the Ionic of the temple of Concord may be pronounced detestable. In this last example the volutes of the capitals are turned diagonally, a mode afterwards adopted by Scamozzi for that order, and also practised in what is called the Composite. Both the Roman and Italian examples are ill composed and totally devoid of grace; yet it does not therefore follow that such arrangement is radically defective and altogether inadmissible; on the contrary, we find it partially employed even in the Grecian Ionic, namely, in the capitals at the angles of porticos, where the volute is so turned, in order that there may be two adjoining faces, instead of a baluster side showing itself externally; and a similar disposition of the volutes throughout, giving four faces to each capital, might be made, perhaps, to produce an agreeable variety; and if authority alone be required to justify it, it may in fact be found in the Ionic order of the temple of Apollo at Bassæ. [Column, p. 384.] Even when comparatively pleasing in its contours, the Roman Ionic capital is poor and devoid of expression, in consequence of the smallness of the volutes, which is such that they almost cease to be characteristic features of the order. To this defect may be added the meagreness arising from the few revolutions made by the spirals, and the omission of intermediate ones; and also the harshness occasioned by the great projection of the ovalo, the narrowness of the face of the capital above it, and by that part forming a straight line, instead of the gracefully-flowing festoon-hem which unites the volutes together in all the Athenian specimens of the order. Perhaps it is unfortunate that any Roman examples of it are to be found in buildings, because that circumstance has led to their being regarded as authorities, whereas many better specimens are to be met with in single capitals and relics of that kind, which, though faulty in many respects, and evidently susceptible of improvement, are at least treated with more taste, and possess a certain richness of character. Numerous studies of both voluted and foliaged capitals may be seen in Piranesi's 'Magnificenza de' Romani;' and the variety of composition displayed in the latter very greatly exceeds what would be imagined by those who are acquainted only with what are referred to as standard examples of that order. This last may in fact be emphatically denominated the Roman order, although such distinctive title is usually applied to what is otherwise called the Composite, but which is only a variety of the foliage-capitalled class, and by no means the most striking as such, there being instances of compound capitals, in which griffins, eagles, human figures, or masks, are introduced above the foliage; consequently, if the voluted variety is to be received as a separate order, each of the others is quite as much entitled to the same distinction. How far the ordinary Corinthian capital differs from that in which the small volutes, or caulicoli, at the angles of the abacus are developed and enlarged to the size of those of the Roman Ionic capital, may at once be seen by referring to Column, p. 386, where a half of each example is placed in juxtaposition; and at page 383 will be found a similar comparison between the capitals of the Tivoli Corinthian and that of the monument of Lysicrates. The contrast presented by the two last is striking enough, there being no similarity of character, but merely such degree of resemblance as serves to make the differences the more obvious. And if that Tivoli example be compared with the one shown in the other cut, and which may be received as an average sample of the order, it will be tolerably evident, even from such comparison alone, that the foliaged capital was treated by the Romans in a variety of modes and in a free artistical spirit. Neither are such distinctions confined to the capitals alone, for different examples present equal diversity in their entablatures and cornices. That of the Tivoli temple is remarkable throughout; and has such a peculiar character stamped upon it, that it almost deserves to be considered a separate order—certainly much more so than the Composite. Among other examples, that of the three columns of the temple of Jupiter Stator is the richest and most elegant in its capital, and is beautifully composed throughout. The Romans bestowed great diversity of character and expression upon this order, as the Greeks had done upon their Doric and Ionic; whereas, if they erred in nothing else, the Italian revivalists and their followers did so in pursuing a directly opposite course, endeavouring to establish a fixed and unalterable standard for each order, reducing them to merely so many architectural formulas, to be applied without any change, on every occasion.

For information respecting Roman buildings adapted to particular purposes, the reader is referred to the articles Arch, Triumphal; Amphitheatre; Aqueduct; Baths; Forum; Mausoleum; Naumachia; Pantheon; Theatre; &c.

ROMAN CATHOLICS. [Catholic Church; Recusants.]

ROMAN DE LA ROSE. [France—*Language and Literature.*]

ROMAN HOUSE and VILLA. [House; Atrium.]

ROMAN LAW. [Rome.]

ROMAN LANGUAGE and LITERATURE. [Rome.]

ROMAN MUSIC. [Music, p. 26.]

ROMAN SCHOOL OF PAINTING. That style of art which was eventually formed, or prevailed, at Rome during the golden age of painting, in the beginning of the 16th century, is termed the Roman school, whether it was practised by subjects of the papal government, natives of the city of Rome, or strangers resident there. The simple fact however, of having practised the art of painting in Rome, does not constitute a disciple of that school. The works of Raphael exhibit this style in its full development or most perfect form, and he is accordingly the head or representative of the Roman school.

The history of this school may be divided into three periods: its origin or gradual formation from the revival of painting in Italy; its development, which was accomplished in the works of Raphael; and lastly, its decline, through his imitators and those of the great Florentine at Rome.

The art of the earlier period cannot be said to have any further connection with the subsequent style, which, through its peculiar characteristics, became distinguished as one of the great schools of Italian painting, than that of having been its basis; although the natural simplicity and dignity of the earlier style characterised the latter throughout, in its purer form.

The immediate founder of the Roman school in its less extended sense was Pietro Vannucci of Citta della Pieve, commonly called Il Perugino, from his having obtained the citizenship of Perugia: although that which may be termed essentially the Roman school both commenced and ended with Raphael, in the same manner as the Florentine did with Michael Angelo; for the styles of these two great masters were rather destroyed than preserved by their imitators.

I. In retracing the progress of the Roman school, we must go back to that original and most antient school of Italian painting, which flourished in the 14th century in various cities of the Roman states, within the limits of antient Umbria; in Gubbio, Fabriano, Maselica, Borgo S. Sepolcro, Urbino, Assisi, and other places.

But the influence of this school, which has been termed the Umbrian, was not confined within these limits. It extended not only throughout Romagna, but over many cities of Tuscany; and although the term Umbrian school has been restricted to the works of the masters of the district alluded to, it might be applied with equal propriety and more system to designate the style of art which prevailed in the works of the revivers of painting in Italy generally, or all the antient masters (gli Antichi), whether Umbrian or Tuscan, anterior to Masaccio; in other words, previous to any acquaintance with or rather study of the works of antient art. Many of the Umbrian painters, and those of Bologna, Arezzo, and Perugia, and therefore also of Pisa, Siena, and Florence, had common masters: and if we compare the dissimilarities of the individual styles of these masters with the dissimilarity of those styles compared with that of Masaccio, we may declare them all to be similar. The only difference between what is termed the early Tuscan and the Umbrian school, is, if any thing, that the latter, with equal simplicity, is somewhat less rigid than the former; and if they did not originate in the same source, they were at least both greatly influenced by the colonies of Greek artists who migrated from Constantinople to Italy, and settled in Venice and Pisa, in the 11th and 12th centuries.

Oderigi of Gubbio, one of the old practitioners of missal-painting, an art which was never quite extinct in Italy, seems to be the most antient painter of this school whose period is ascertained with any degree of certainty; he died about 1300 A.D. Oderigi appears to have been an active reviver of painting, and he was a man of reputation in his day. He is mentioned honourably by Dante, who terms him 'L'onor d' Agobbio, e l'onor di quell' arte.'

There is mention also of three other antient painters of Gubbio: Cecco and Puccio, who were employed in 1321 in painting the dome of Orvieto; and Guido Palmerucci, who was employed about 1324, in the town-hall of his native city.

A still more important name in the early history of the Roman school is that of Pietro Cavallini, who is said to have received instruction from Giotto while at Rome. A Crucifixion by this master, still extant at Assisi, is a remarkable production. The return of the papal government from Avignon to Rome gave a new impulse to the arts; the most skilful artists were sought throughout Italy to decorate the temples and palaces of the luxurious pontiffs of Rome. Of these the principal were Ottaviano Martis, and Gentile da Fabriano, a master of much greater merits. Fabriano was surnamed Magister Magistrorum, and practised his art in many parts of Italy. In 1417 we find him engaged at Orvieto; he resided afterwards at Venice, where he obtained the rank of patrician, and was the master of Giacopo Bellini, whose sons were the founders of the Venetian school. His style, which by Michel Angelo was pronounced to be, like his name, 'Gentile,' somewhat resembled that of Fra Angelico da Fiesole, though it was much inferior to it.

Piero della Francesca, or Piero Borghese, advanced the art still further; he was reckoned one of the best geometricians of his time, and was the first Italian who had any knowledge of the principles of perspective. He introduced immense improvements in the management of draperies, and also greatly enlarged the manner of treating the naked figure. Bramante studied the works of Piero, who was fond of introducing architectural backgrounds in his pictures, which he executed in tolerable perspective. Additional improvements were made by Bartolomeo Corradini of Urbino, called Fra Carnevale, who gave great character to his heads, and was the first to introduce portraits into historical compositions, in which practice he was afterwards followed by Raphael, who paid great attention to the works of this painter at the commencement of his career.

Niccolo Alunno of Foligno and Benedetto Bonfigli complete the list of the considerable artists of this school previous to and contemporary with Pietro Perugino, the master of Raphael, and Giovanni Sanzio of Urbino, his father. Although, through the united efforts of the above masters, painting had attained to many high and pleasing qualities, true taste in design may be said to have totally failed them. They had not yet discovered what was beautiful and what was not, or what belonged to the individual and what to the class. Their art was not truly imitative, nor does it appear that an appearance of reality was an object with these painters; they seem to have considered that their end was sufficiently accomplished in an intelligible indication of whatever they represented. The deficiency of this school could only be supplied through the study of the antique, and to supply it in a great degree was a distinction which fell to the lot of Masaccio, who must be looked upon as the leader of great painters of the 15th century, or the Quatrocentisti, as the Italians have termed them, among whose works we first perceive any distinctive characteristics of style.

It cannot be denied that Perugino owed his great superiority over his predecessors to his visit to Florence, where, whether he became the pupil of Verocchio or not, which is a matter of dispute, he was at least enabled to study the noble works of Masaccio. His taste was however still dry and mean, his design was meagre and feeble, though often correct, his draperies were stiff and in a little manner, yet his colouring was sometimes exceedingly rich, and for graceful delicacy of attitude and motion, and a softness and simplicity of expression, he surpassed all his contemporaries. But there is a symmetrical repetition and similarity in the disposition of his figures, which betray a total absence of anything like vigour or truth of composition, and which place him at an immeasurable distance from his great scholar. No pupils ever imitated their master so closely as, with the exception of Raphael, did those of Perugino; and many of their works are reputed works of their master. His most celebrated scholars were, Bernardino Pinturicchio; Andrea Luigi of Assisi, called L'Ingegno on account of his great abilities, who became blind when still young; Domenico and his son Orazio di Paris Alfani; Eusebio da S. Giorgio; Giannicola da Perugia; Lo Spagna; Berto di Giovanni; Sinibaldo da Perugia; Adone Doni of Assisi; and Palmerini of Urbino. The works of all these masters were more or less conspicuous for symmetrical composition and a profuse application of gold.

II. We now arrive at the pride of Perugino and the glory of the Roman School, Raffaello Sanzio d'Urbino, the first of painters; for moral force in allegory and history, unrivalled; for fidelity in portrait, unsurpassed; who has never been approached in propriety of invention, composition, or expression; who is almost without a rival in design; and in sublimity and grandeur, inferior to Michel Angelo alone, whose prophets and sibyls in the Capella Sistina are in these respects unquestionably the triumphs of modern art.

It must not be supposed that Raphael attained these great qualities intuitively: they were the result of long and intense application; and in the works of no artist is the progress of improvement so apparent as in those of Raphael. He painted in three styles: his first was that of Perugino. His second was an enlargement of that style in the taste of Fra Bartolomeo, and is termed his Florentine. But this change or improvement in style was not effected through an acquaintance with that great painter alone, but also through the impression made upon Raphael's mind by the works of Masaccio, of Lionardo da Vinci, and also of Michel Angelo, at Florence. His third style, which is the subject we have now more particularly to consider, was peculiarly his own; although those magnificent works the Prophets and Sibyls of Michel Angelo were the principal causes of its ultimate fulness and grandeur. This third style, which is the proper style of Raphael, constitutes the Roman school in its full development, which is the least defective of all the schools of painting.

To allow that the Roman school is principally indebted for its grandeur to the works of the great Florentine on the vault of the Sistine Chapel, is allowing no more than is just. But to venture to the extent of asserting, as Sir Joshua Reynolds has done in his fifteenth discourse, that 'the artists of that age, even Raffaelle himself, seemed to be going on very contentedly in the dry manner of Pietro Perugino, and, if Michel Angelo had never appeared, the art might still have continued in the same style,' is not only doing the highest injustice to Raphael, but also to Lionardo da Vinci and to Fra Bartolomeo, whose styles were essentially developed, and who were themselves considerably advanced in life, especially the former, before Michel Angelo had executed a single great work in painting. When the Cartoon of Pisa was exhibited in 1506, which work cannot in any respect be compared with the vault of the Capella Sistina, Bartolomeo was in his thirty-seventh and Da Vinci in his fifty-fifth year. [TUSCAN SCHOOL.] How much more to the purpose is the remark of Fuseli, who says that Bartolomeo 'was the true master of Raphael, whom his tuition weaned from the meanness of Perugino, and prepared for the mighty style of Michel Angelo.' Whatever effects the Cartoon of Pisa and the works of the Florentine school had upon Raphael's style, must have been evinced in the great picture of Theology, or the Dispute on the Sacrament, as it is also called, in the Camera della Segnatura in the Vatican, which was painted in 1508, and was his first great work in Rome. But the picture of Philosophy, or the School of Athens, which was painted opposite to it immediately afterwards, exhibits a great aggrandizement of style, and in it the characteristics of Raphael's third style are at least essentially if not completely developed. Now this aggrandizement could not have proceeded from the works of Michel Angelo, since the paintings of the vault of the Capella Sistina were not commenced until some time after that great work was executed. It therefore proceeded from other causes, from Raphael's own additional experience, and from the study of the works of antient art in Rome, to which Raphael was, in common with Michael Angelo, principally indebted, and infinitely more so than to the works of that truly great master. Even the Heliodorus (which, although it was painted in the time of Julius II., if not commenced, must at least have been finished after Raphael had seen the vault of the Capella Sistina), does not exhibit any remarkable superiority of style over the School of Athens, although it is decidedly superior; but other causes besides the works of Michael Angelo must have contributed to produce this result. The work of Raphael in which the imitation of the style of Michel Angelo is most apparent, is the Incendio del Borgo, decidedly the worst production of Raphael's maturer years; indeed it is even doubtful whether he had any hand in the execution of that work.

In considering however the respective claims of these two great masters to originality of style, it should be borne in mind that Raphael's great works in the Camera della Segnatura preceded those of Michel Angelo on the vault of the Capella Sistina, and that what has been generally considered to be Michel Angelo's greatest work, the Last Judgment, was first commenced in the pontificate of Paul III., years after the pencil of Raphael had ceased its labours, and was not completed until twenty-one years after the death of that great painter. Therefore these two extraordinary men may be safely said to have been indebted the one to the other.

Raphael has had many critics, but of these perhaps Mengs is the most discerning and the most just, although that painter's extraordinary veneration for the works of antient art must not be forgotten while we consider his critique upon the works and genius of Raphael. The only essential fault, in the opinion of Mengs, in Raphael's style, is a deficiency of the ideal in almost every department. But is it not by reason of this very deficiency, as Mengs views it, that his style distinguishes him from and raises him above all other painters? Raphael was pre-eminently and essentially natural; idealize his style, and you immediately degrade him to the level of Guido.

His forms are neither so ideal, nor, in one sense, so perfect as the Apollo or the Mercury, but they are equally grand, and more natural. Such forms would be incompatible with Raphael's style. They are supposed to represent beings beyond the influence of the common emotions of mankind. His design however is very little inferior if not equal to the Discobolus, the Gladiator, or even the Laocoon; but it must decidedly yield in style to the Torso of Apollonius, and in beauty and elegance to the Antinous.

There is a degree to which the powers of imitation may be combined with those of the imagination, which, when regulated by a just refinement of feeling or taste, constitutes the perfection of painting, and this degree, though not attained, was in the aggregate approximated more nearly by Raphael than by any other painter. He never designed a figure which he did not inspire with appropriate sentiment; the affections of mankind were the sphere of his genius; from the calculating sage to the thoughtless infant, his works are the history of the human heart, and deservedly has he been entitled the 'painter of the passions.' The elements of his style are nowhere more apparent than in the Cartoons at Hampton Court. To particularise amidst so much excellence, and to single out the works in which Raphael has been most eminently successful, is rather a delicate task; yet perhaps the following examples may be instanced as being more decidedly conspicuous for these particular qualities which characterise his style:—for grandeur of design, the Heliodorus; for sublimity of character and conception, the Madonna di San Sisto; for composition and expression, the Cartoons; and perhaps for invention and general technical excellence, the Transfiguration, his last performance. [Raphael.]

The style of Raphael has seldom been found congenial to their taste by the lovers of colour, and certainly those who consider the perfection of painting to consist in splendid colouring must not look for it in the works of the Roman school, but in those of Paul Veronese or of Rubens. Many critics have regretted that Raphael did not colour like Titian; but colour was to Raphael a *means*, and not an *end*, as it was with the majority of the Venetian painters; and its effect is to dazzle and to obscure, rather than to enhance the essential qualities of the grand style. For as the painted face of a player harmonises with the accompanying spectacle and the tone of light around, and would as certainly be ridiculous if exposed to the light of day, so the Venetian colouring, which is in such perfect harmony with the subjects of that school and their general treatment, would as certainly be in utter discordance with those qualities which characterise the style of Raphael. Even Ludovico Caracci, the founder of the Eclectic school of Bologna, discovered that Venetian colouring was inapplicable to the subjects which he chose for his own pencil. And Raphael would not have been the great painter that he proved himself to be, had he chosen any other than the sombre colour for which he is so conspicuous, and which, so far from being a defect in his style, is indeed an additional evidence of his profound genius. These remarks do not refer to the carnations particularly, which should always harmonise with the draperies, but to the composition of colours generally, to their choice and intensity, and also to the stuffs and materials of which the draperies are composed. Raphael rarely if ever painted silks or satins: most of the Venetians seldom painted anything else. [Venetian School.]

Raphael had many scholars and many imitators; of the former, the principal were Giulio Romano, Gianfrancesco Penni (with Giulio, Raphael's principal heir), and Perino del Vaga: these painters completed, from Raphael's designs, the great works in the Vatican, which he had left unfinished.

Giulio Pippi, called Giulio Romano, certainly the most eminent of all Raphael's scholars and imitators, was conspicuous for the correct and powerful design of his master, but in other respects he never approached him. Although he had great powers of invention, an unpleasing expression and an evident absence of sentiment prevail throughout his works. He is also heavy both in design and colouring; but his particular employment under Raphael, that of dead-colouring aud preparing his works in oil, may have greatly contributed to this effect. Giulio left Rome during the pontificate of Clement VII., shortly after the completion of the Constantine series in the Vatican, and, at the invitation of Federigo Gonzaga, repaired to Mantua, where he founded a school and painted his famous works, the Fall of the Giants, and the Loves of Cupid and Psyche. [Giulio Romano.]

Gianfrancesco Penni, with little less vigour than Giulio, was conspicuous for more of the grace of his master. Pierino Buonaccorsi, called Perino del Vaga, displayed nearly equal powers. Other pupils and assistants of Raphael in the stanze and the loggie of the Vatican, were—Giovanni da Udine; Polidoro Caldara da Caravaggio, celebrated for his imitations of antient bassi-rilievi; Pellegrino da Modena; Bartolomeo Ramenghi, called Il Bagnacavallo; Vincenzio di S. Gimignano; Timoteo della Vite; Raffaellino del Colle; Benvenuto Tisi, called Il Garofolo; and many others too numerous to mention here.

III. The accession of Adrian VI. to the papal chair had for a time paralysed the arts, but they were shortly inspired with new vigour by his successor Clement VII., Guilian de' Medici, who continued the works that had been interrupted by Adrian. But a more serious interruption succeeded in the sack of Rome, in 1527, by the soldiers of Bourbon. The vast school of painters formed by Raphael was totally dispersed: it spread however the elements of his style all over Italy, although scarcely a single beauty of the original was to any extent preserved in the copies.

In the pontificate of Paul III., the arts commenced again to revive in Rome. Michel Angelo executed his great work of the Last Judgment, the labour of eight years, by the orders of this pontiff: it was completed in 1541. The effect however of this work was for a time fatal to painting: hosts of copyists and mannerists arose, who, possessed with a mania for representing the naked figure, and sacrificing everything to anatomical display, imagined the perfection of design to consist in violent action and muscular protuberance; and in imitating the *manner*, they imagined they had acquired the *art* of Michel Angelo.

This great painter, who in the time of Julius II. had himself been chiefly instrumental in raising painting nearer to perfection than it has ever attained in modern times, lived also to see it degenerate, greatly through his own influence, into a mere handicraft in the time of Pius IV., when a reference to nature was considered as an acknowledgment of a want of genius.

The most distinguished mannerists of this school and period, whose style was a species of compound of those of Raphael and Michel Angelo, without the correctness or purity of the former, and with only the manner of the latter, were Taddeo and Federigo Zuccari. The former died young. The latter executed vast works at Florence, which were, however, remarkable for their vastness alone; and he has left specimens of his pencil in the principal cities of Italy. He succeeded Girolamo Muziano as president of the Academy of St. Luke at Rome, which had been lately founded by Gregory XIII. at the instance of Muziano. Gregory was elected in 1572.

The following exceptions should be mentioned, as being tinguished for their greater propriety of style, from the eral host of mannerists:—Girolamo Siciolante of Serneta, Marcello Venusti, and Livio Agresti, all scholars Perino del Vaga; also Scipione Pulzone, called Gaetano, scholar of Giacopo del Conte, both excellent in portrait.

uiseppe Cesari d' Arpino succeeded Federigo Zuccaro ublic estimation at Rome; but though without a rival in t city until the appearance of Michel Angelo Amerighi, Il avaggio, he cannot be said to belong to the Roman school. heavy and vulgar nature of Caravaggio's style was in ct opposition to the ideal mannerism of Cesari's. They had their partisans, who were termed respectively naisti and idealisti; the latter prevailed. Annibale Cai also endeavoured in vain to reform taste in Rome; works of this great master in the Palazzo Farnese had e or no effect upon the style of the Roman painters of t period, and Cesari left a numerous school of imitators. these noble works, certainly inferior only to those of hel Angelo and Raphael in Rome, eventually had their ct, and painting was again restored to something apaching its former splendour; and what the painters of ogna had borrowed from the Romans in the pontificate lement VII., the pupils of the Caracci returned with st in that of Urban VIII.

better style was adopted by Federigo Baroccio of Ur. which might boast of a nearer approach to the cor ess of form of the great founder of the Roman school, nis colouring was generally artificial, and very different n that of Raphael. Its tone is unpleasant, a cold violet prevails throughout, and there is a striking deficiency ellow in his carnations, which in the lights are pink, in shadows grey. Baroccio had several imitators, but his nce upon the general character of Roman art was inlerable. The Eclectic school of Bologna [Bolognese ool] seems to have had the principal share in reforming art in Rome. During the pontificates of Paul V., gory XV., and Urban VIII., the celebrated pupils of Caracci, Domenichino, Guido, Guercino, and Lanfranco, e much employed by those pontiffs; and the example se great masters, but more especially of Domenichino, uced many good painters, of whom we may mention following:—Antonio Ricci, called Barbalunga; Camassei; anni Carbone; Francesco Cozza; Pietro del Po; ini; Giambatista Passeri; and Luigi Scaramuccia; and e were many others of considerable merit. The school of Caracci seems to have had a more immediate influence n portrait painting, truth or fidelity of representation indispensably requisite to constitute excellence in aiture. The excessive mannerism of the painters of period had so generally incapacitated them for executing ing excellent in that department, that it began to be y a distinct profession, and the following masters disuished themselves as excellent portrait painters, though did not confine themselves quite exclusively to por: — Antonio di Monti; Pietro Fachetti; Antonio lvati; Grammatica; Ottavio Leoni; and Baldassare i, called Galanino.

pon the imitators of Domenichino followed the bold e of Lanfranco, whose most successful scholar was Giao Brandi; and contemporary with Lanfranco flourished ano in Rome. Pier Francesco Mola was an imitator of style.

rom the studio of Albano came Andrea Sacchi, a painter drew well and coloured admirably, who never beed labour upon a trifle, and who was better versed the theory of art than any of his contemporaries or ate predecessors. There is a nobility and grandeur his style, and a truth and breadth in his execution, ich distinguish him as one of the noblest disciples of the man school, second only to Giulio Romano in invention, l in all other respects inferior to its great founder alone. phael was his model of perfection, but he was no servile tor; he could appreciate also the beauties of Titian of Correggio; and he had recourse to the same sources ough which his great model attained to excellence—nae and the antique, but he availed himself only so far of antique as it served to regulate his study of nature.

o inconsiderable ornament also of the arts of Rome of period was Nicholas Poussin, for though a Frenchman rth, he was essentially a Roman painter; he formed style from Raphael and the antique. He attended also cademies of Domenichino and of Sacchi, being a great of the works of those masters; he considered Domenichino inferior to Raphael alone. His style was however very peculiar, and had no influence upon the arts in Rome; his works have too much the appearance of painted bassi-rilievi.

Pietro Berrettini, called also Pietro da Cortona, set himself up as the rival of Sacchi in Rome, and if the number of imitators is a criterion of the degree of excellence, Pietro da Cortona was certainly superior to Sacchi. The art of Sacchi was not so easily imitated. The style of Cortona was rich and attractive, but superficial and incorrect, and he takes the lead in that class of painters termed machinists by the Italians.

The scholars of these two masters formed two rival factions of art, which divided Rome: that of Sacchi was headed by Carlo Maratta, supported by Ludovico Garzi: that of Cortona, by Ciro Ferri, supported by Romanelli. Bernini, who during the pontificates of Urban VIII. and Innocent X., in matters of art was all-powerful in Rome, opposed, as was to be expected, that party which was conspicuous for good taste; and for a time the machinists prevailed. But the school of Cortona was predominant only in fresco, for in oil Maratta was unrivalled. In 1689 however Ciro died, and Maratta stood alone; and upon the accession of Innocent XII., in 1691, he was appointed inspector of the stanze of the Vatican, and in 1702, by the orders of Clement XI., he restored the works of Raphael in those apartments, which had considerably suffered through time and neglect. He had restored previously the frescoes of Annibale Caracci in the Palazzo Farnese. He died in 1713. His style was generally considerably less vigorous than that of Sacchi, and both his colouring and his composition were occasionally artificial; his drawing was also sometimes incorrect; his taste was upon the whole very inferior to his master's, though his style has been termed more graceful.

Maratta formed a most numerous school, but its chief characteristics were the studied composition and affected grace which are the blemishes of his own style.

Maratta has been termed the last of the Romans, and perhaps he may be safely termed the last of the Romans who has merited the name of a great painter; for neither Pompeo Batoni nor Mengs can be said to dispute that claim with him, though both are deservedly celebrated names. The former gave too much importance to high finish; the latter was too blindly devoted to the antique. Batoni painted excellent portraits, and Mengs drew correctly, but he was so eager after the ideal, that he lost nature in the search of it; in this respect Batoni has greatly the advantage over Mengs. They were both eminently academic, and for mere technical excellence have not often been equalled; but there is a palpable absence of the 'mens divinior' and moral sentiment in their works, which are more than ordinarily conspicuous for that insipidity and monotony so generally attendant upon the fastidious preciseness of academic art.

(Vasari, *Vite de' Pittori*, &c.; Bellori, *Vite de' Pittori*, &c.; Lanzi, *Storia Pittorica;* and Fiorillo, *Geschichte der Mahlerey.*)

ROMAN WALL. [Britannia.]

ROMANCE originally signified any composition in the Romance language, or dialects which superseded the Latin after the fall of the Western Empire. [Romance Language.] As however, in course of time, the Trouveres of North France composed a number of poems containing fictitious narratives of war and love, and their lays became popular all over France and in the neighbouring countries, the name of Romance was more particularly applied to all compositions, whether in verse or prose, in any language, which treated of marvellous or uncommon incidents, and the name has been retained to this day in several European languages to signify a fictitious narrative. The Italians and French call a novel 'un romanzo,' 'un roman.' But the French call an historical ballad 'une romance,' in the feminine gender. The distinction between romance and the modern novel is shown under Novel. The appellation Romance in a narrower sense is applied to those compositions which refer to the ages of chivalry, either real or supposed. [Chivalry.]

The oldest romances in this latter sense appear to have been legendary stories concerning Arthur and the Knights of the Round Table, and they were of English origin; but the original narratives, if they ever existed in writing, which is doubtful, are lost. The earliest romantic legends which have come down to us are of the twelfth century: Geoffrey of Monmouth's Latin Chronicle of England; Turpin's

Latin Chronicle in France; Wace's 'Le Brut,' a metrical romance concerning the fabulous history of England, in Norman French; 'Le Roman du Rou,' by the same writer, concerning Rollo and his successors; and 'I Reali di Francia,' in Italian prose. To these may be added the Latin romance of Gualtieri, found in the Chronicle of La Novalesa, which relates to the wars of Attila; next in order of date comes Guido della Colonna's 'War of Troy,' and Mathew Paris's account of the Round Table. [Geoffrey of Monmouth.] The 'Roman de la Rose' was written under St. Louis of France. At that time chivalry was established over all Europe, and the writers of romance introduced the customs and manners of chivalry into their narratives of events, real or supposed, long antecedent to the existence of chivalry.

The vast subject of romantic literature, in its general and more extended sense, may be divided into the following branches: — 1, Romantic ballads and traditional songs, which appears to be the oldest form, and which have existed among most nations in their primitive state. The songs of the antient bards, and those concerning Arminius, which are mentioned by Tacitus (*Annal.*, ii 88, and *German.*, 2); the German Niebelungen; the poems of Antar, and others before the æra of Mohammed; the song of Roland, mentioned by the chroniclers of Charlemagne; and the old Spanish romantic ballads, all belong to this class. M. de Tressan collected several fragments among the mountaineers of the Pyrenees, which seem to belong to Roland's 'Cantilena,' or war song. 2, The narrative romances of chivalry concerning the deeds of Arthur and the peers of the Round Table. 3, The romances concerning the supposed wars of Charlemagne against the Saracens. 4, The Spanish and Portuguese romances concerning the fabulous exploits of Amadis and Palmerin. [Amadis de Gaula.] 5, The classic romances concerning Jason, Hercules, Alexander, those heroes having been transformed into knights of chivalry. 6, The epic romances of the Italians in the fifteenth and sixteenth centuries. [Pulci.] 7, The spiritual or religious romances concerning the miracles of saints and the death of martyrs, such as the 'Contes dévots' of the French, the 'Golden Legend,' &c. 8, The pastoral romance, which Cervantes ridiculed, and which afterwards gave rise in the seventeenth century to the interminable and dull romances of La Calprenède, Madame de Scudery, and others, in which perfection of beauty and pure spiritual love are the chief ingredients. 9, The comic romances, which were written chiefly as parodies of the heroic and chivalrous romances. Such were those of Rabelais, Cervantes, Mendoza, and Scarron. 10, The political romances, such as Télémaque, Sethos, &c. 11, Lastly comes the modern novel, which forms a distinct species, as it does not deal in the marvellous and supernatural, but represents men conformably to the manners of the age in which they lived.

The library of romance is extremely numerous; bibliographical catalogues of those of a particular class and nation have been published, such as Count Melzi's 'Bibliografia dei Romanzi e Opere di Cavalleria in Italiano,' Milan, 1838. The Spaniards have several collections of their old romances: 'Poesias escogidas de nuestros Cancioneros y Romanceros antiguos,' Madrid, 1796; Depping, 'Colleccion de los mas celebres Romances antiguos Españoles, historicos y caballerescos,' Londres, 1825; 'Romancero del Cid Ruy Diaz, en lenguage antiguo, recopilado por Juan de Escobar,' Madrid, 1818. Dr. Ferrario has published a good work on the Italian romances of chivalry: 'Storia ed Analisi degli antichi Romanzi di Cavalleria, e dei Poemi Romanzeschi d'Italia, con Dissertazioni sull' Origine, sugl' Istituti, sulle Ceremonie dei Cavalieri, con Figure tratte dai Monumenti dell' Arte,' 4 vols. 8vo., Milan, 1828-9. A notice of Ferrario's work appeared in the 'Foreign Quarterly Review,' No. XII., October, 1830. Panizzi, in the first or introductory volume of his edition of Boiardo, London, 1830, has elaborately investigated the origin and history of the romances of chivalry. Turner, in his 'History of the Anglo-Saxons,' Ritson, in his 'Historical Essay on National Songs,' Dunlop, in his 'History of Romantic Fiction,' and others, have treated of the history of romance in various countries.

ROMANCE LANGUAGE ('Langue Romane' or 'Romande,' in French) is the name given to a kind of bastard Latin, which came into common use in Western Europe after the fall of the Roman Empire, among the populations formerly subject to Rome, while the Northern conquerors, the Goths, Franks, Burgundians, Langobards, &c., spoke their own language or dialects, which are called by chroniclers of the times 'lingua Teutonica' or 'Teutisca.' The conquered people were called by the general name of Romans, from whence came the name of the language, which was also called 'vulgaris.' In course of time however the conquerors adopted the language of the conquered, who, being more instructed, furnished most of the priests and scholars of the age. But the language thus adopted by both the conquering and the conquered races, although essentially formed of Latin elements, differed according to the various localities and the greater or lesser degree of admixture of the northern people with the Roman population. For instance, King Dagobert in the seventh century published a statute, styled 'Lex Alamannorum,' for the use of the German tribes who had crossed the Rhine, the language of which differs from that of the 'Lex Ripuariorum,' which the same king published for the use of the people situated between the Lower Rhine and the Mosa, who were mostly of old Roman extraction. The former employs the *ille* as an article before substantives, in imitation of the articles *su* and *der* used by the Goths and Franks in their own language; but the Lex Ripuaria does not employ *ille* for the same purpose. In the old charters of Italy and Spain of the eighth and ninth centuries, we find *ille* and *ipse* employed likewise as articles, *ipsa ecclesia, illa alia, illas casas, illa strada, illo rio,* &c.; but these charters are not so old by a century or two as the Franco-Latin documents, in which those pronouns are introduced for a similar purpose. The oldest document in the 'España Sagrada' in which the *ille* appears as an article is A.D. 775; and the oldest of those of Italy quoted by Muratori are of the years 713 and 736.

Of the various dialects thus formed, that of the south of France, called afterwards Langue d'Oc, became a refined language sooner than the others, and retained its superiority from the tenth to the thirteenth century, when the Italian, Portuguese, and Spanish languages assumed a regular grammatical and literary form, which they have retained; whilst the Romance of the south of France has gradually fallen into disuse, having given way to the Northern French Langue d'Oil or d'Oui. The latter appears to have originally differed little from the Langue d'Oc, but it gradually changed its terminations, and assumed other peculiarities of form, which have been retained by the modern French. It is demonstrated by Raynouard that the inhabitants of Northern France in the ninth century spoke the same language as those of the south. The text of the oath taken at Strasburg in the year 842, by Louis, called the Germanic, before the French people, would alone be a sufficient proof of this. The text of this curious document is as follows:— 'Pro Deo amur et pro Christian poplo, et nostro commun salvament, dist di en avant, in quant Deus savir et podir me dunat, si salvara jeo cist meon fradre Karlo, et in adjudha, et in cadhuna cosa, si cum om per dreit son fradre salvar dist, in o quid il mi altre si fazet, et ab Ludher nul plaid nunquam prindrai, qui meon vol cist meon fradre Karle in damno sit.' (Roquefort, *Glossaire de la Langue Romane*, Paris, 1808, 'Introduction.')

The gradual process by which the corrupt Latin spoken in the provinces of Western and Southern Europe in the sixth, seventh, and eighth centuries was transformed into the Romance languages of the ninth and tenth centuries is very clearly exhibited by Raynouard, in his 'Elémens de Grammaire de le Langue Romane avant l'an 1000.' The Latin cases had become neglected or confused, and to supply their place the prepositions *de* served to denote the genitive and *ad* the dative. The next step was to cut off the final syllable of the noun, and so to make it indeclinable. Thus the accusative abbatem became abbat; majestatem, majestat; ardentem, ardent; amantem, amant; and so forth. The accusatives in *ionem* were reduced to *ion*, religionem, religion, &c. When the suppression of the Latin termination left two harsh-sounding consonants at the end of the word, a euphonic vowel was added, 'arbitr-um,' 'arbitr-e.' The pronouns *ille* and *ipse* had been used in the corrupt Latin as auxiliary to substantives: 'Dono illas vineas quomodo ille rivulus currit;' 'Illa medietate de ipsa porcione,' &c. From *ille* so used originated the Romance articles *el, lo, la,* and from *ipse* the demonstrative pronouns *es, so* or *su*, and *sa*, which the Sardinian dialect has retained to this day as an article. These articles were declined with the prepositions *de* and *a* 'Ego Hugo della Roca;' 'Fe-la vite;' 'Villam nostram quæ vocatur al la Cor- ꞉ These and other examples taken from docu- the ninth century show the introduction of articles ɪe written language which affected to preserve in ree the Latin form; the change must have been d and complete in the spoken or popular idiom. inges took place in the pronouns and the verbs, for refer to Raynouard's *Elémens*. The use of the verb *aver*, 'habere,' already existed in the Latin, in form: 'De Cæsare satis hoc tempore dictum Cicero, *Philip V.*, 28); 'Si habes jam statutum agendum putes' (*Epist. ad Famil.*, iv. 2). The ɔ used the auxiliary 'esse' in some tenses of the The Romance language only made the use of these s more general.

.D. 1000 the Romance language may be considered become fully formed, and the age of the Trouba- gan. William, count of Poictiers, is one of the hose works have been preserved. In the twelfth e institution of the Courts of Love was established. ury was the brilliant age of Romance poetry, and ne Wace wrote in North or Norman French his du Rou.' In the thirteenth century the war and of the Albigenses, and the establishment of the n, frightened away many of the adepts of 'la gaya and afterwards several other events, such as the of the house of Anjou or Provence to the throne s, and the encroachments of the northern French, ed to the decline of the Troubadour poetry, and at time of the Romance language. The Italian or ose upon its decay. When Dante appeared, the d already begun, and it was completed during the of the fourteenth century. (Raynouard, *Choix de riginales des Troubadours*; Professor Diez, *Leben ke der Troubadours*, Zwickau, 1829.) In the century king René made some attempts at reviving y of the Langue d'Oc, but the race of the Trouba- s now extinct, and the only result of his endeavours ollecting and compiling the lives of the old Trou- by the monk of the isles of Hyeres, 'Le Monge des r.' In Eastern Spain also the Inquisition destroyed SS. in the Limosin or Valencian language, as being l of containing heresy. In 1434 the library of the de Villena at Barcelona was burnt on suspicion of g sorcery. (Ferrario, *Storia ed Analisi degli an- nunzi*, &c.)

is political and social circumstances had contributed the Langue d'Oc that early refinement in an age rative ignorance and barbarism which is still a f surprise to philologists and historical inquirers. rinces of Southern France had not, like Italy and ern parts of France, been overrun by a succession rians; they had not been exposed to the ravages of onians, the Huns, and the Danes. The Burgun- d the Visigoths, who had settled there nearly about e time, were more civilised than the other German hey amalgamated themselves gradually and quietly old inhabitants, and they applied to agricultural which a fertile soil and a happy climate rendered and productive. The country suffered no subse- vasion from the northern tribes, and the victory of Martel in the plains of Tours arrested the advance racens from the west. Southern France was, it is bjugated by the Franks, who had occupied the s north of the Loire, but the Franks had by that med themselves into a regular monarchy under d Charlemagne, and were no longer unruly barba- During the decline and imbecility of the later princes Carlovingian dynasty, Southern France became a and independent state, of which duke Bozon, an d vigorous man, became monarch, and the kingdom s or Provence extended over the whole south of

The descendants of Bozon retained their sove- for more than two hundred years; and when the e ended in 1092, in the person of Count Gillibert, s became the dowry of his daughters, of whom the ouce, heiress of Provence, was married in the year Raymond Berenger, count of Barcelona, and her tephanie married the count of Toulouse. A treaty, d in 1125, between the counts of Barcelona and e, fixed the division of the states of Gillibert be- hem. Another powerful baron, the count of Poitiers, duke of Aquitaine or Guyenne, which afterwards came by marriage into the possession of Henry II. of England. These three states, Barcelona, Toulouse, and Guienne included the whole country in which the Langue d Oc was spoken. The union of Provence with Catalonia introduced into the former country a taste for poetry and chivalry, which was fostered in Spain by the Moors. The maritime towns of Catalonia and Provence carried on a lucrative trade, all over the Mediterranean, and Catalonian armaments took an active part in the Eastern wars between the Greeks, the Normans, and the Saracens. All these circumstances contributed to refine the manners of the people as well as their language, and the singular institution of the Courts of Love gave a peculiar turn to their poetry. [TROUBADOURS.]

The Langue d'Oil, or Northern French, also called sometimes Norman French, having become the language of the court and capital of the kingdom of France, gradually encroached upon the Langue d'Oc, as the various provinces south of the Loire became incorporated with the monarchy. From the 13th century downwards, the edicts and ordinances of the French kings being issued in the Langue d'Oil, were forwarded, either in the original or translated into Latin, to the provinces of the south. The writers of Northern France, the Trouvères, refined their own language, and found encouragement at court, which was not extended to the writers in the langue d'Oc. Ronsard, who was a native of the south, in his 'Abregé de l'Art Poetique,' complains of this: 'Now that our France is all subject to one king, we are obliged, if we wish to attain honour or fame, to speak his language, else our works, however honourable and perfect, would be thought little of, or might perhaps be altogether despised and neglected.' With the invention of printing, copies of the works in the Langue d'Oil were speedily multiplied, while those of the Troubadours remained mostly in MSS. confined to a few libraries. In the 16th century it was enacted that all public acts and deeds should be written in French. The Langue d'Oc, being thus restricted to the mere purposes of a domestic idiom, degenerated into various pâtois or dialects. Still there appeared, here and there, in the seventeenth and eighteenth centuries, several native poets who wrote with spirit and humour in their respective patois, such as Lesage, a Languedocian, whose burlesque and frequently licentious poems were published at Montpelier: 'Les Folies de le Sage,' 1650; Ader, 'Lou Gentilhomme Gascoun,' Toulouse, 1610, and 'Lou Catounet Gascon,' 1611; a version of Homer's 'Batrachomyomachia,' in Gascon, 'La Granoul-Batromachio,' Toulouse, 1664; 'La Pastourale (a comedy in 4 acts) deu Paysan que cerque mestié a son hils,' in the dialect of Béarn, by Foudeville de Lescar, Pau, 1767; 'L'Embarras de la Fieiro de Beaucaire,' by Michel, Amsterdam, 1700; 'Actes du Synode de la Sainte Reformation,' Montpellier, 1599, a satire against the Calvinists, by Reboul, a witty but profligate adventurer, who was at last executed at Rome, under Pope Paul V., in September, 1611, in consequence of his undiscriminating satirical propensity; 'Lou Banquet,' par Augié, Gaillard, Paris, 1583; the 'Jardin deys Musos Provençales,' Aix, 1628; &c.

In Spain the Latin language became corrupted, though perhaps less rapidly and at a later date than in Italy and France, which is proved by the fact that during the eighth and ninth centuries masters were procured from the Peninsula to teach that language in Italy. It is another evidence of this, that till the beginning of the 12th century, Latin, though corrupt, was the only language used among the Christian population of the Peninsula, not only in the acts of the cortes and councils, but also in the municipal fueros, the public edicts, diplomas, testaments, and the writings of authors. It was also the language of the tribunals, until San Fernando, about the middle of the 13th century, caused the 'Liber Judicum' to be translated into the vulgar tongue.

The corrupt Latin of Spain gave rise to the Catalonian and Valencian, the old Portuguese or Galician, and the Castilian or modern Spanish. The last two, and especially the Castilian, received a considerable admixture of Arabic words (said to be about 2000 in the Spanish language), from which the Catalonian remained comparatively free. The process of corruption of the Latin into Romance was the same as in France and Italy, and may be traced even in the writings of the clergy, who professed to use the literary language of the country. Elipando, bishop of Toledo, a man of learning for the time, who strongly opposed the introduction into Spain of the tenets of the supremacy and infallibility of the Roman see, writes to Felix, bishop of Urgel, in the following style: 'Domino Felice, sciente vos reddo quia vestro scripto accepi....direxi vobis scriptum parvum de fratre Militano ... ego vero direxi epistolam tuam ad Cordoba,' &c.

It is impossible to fix the epochs of the origin of the various languages of the Spanish Peninsula. The Catalonian and Galician or old Portuguese appear to be the oldest. The Castilian, notwithstanding the assertion of Bouterwek to the contrary, was not formed in the eleventh century; its oldest existing monument, the poem of 'El Cid,' is not older than the year 1200. Previous to the twelfth century the Galician, or old Portuguese, appears to have prevailed in all western Spain. An old MS. Cancioneiro in this dialect, belonging to the library of the Royal College of the Nobles at Lisbon, of which Sir Charles Stuart obtained a copy, which he communicated to Raynouard, speaks of the Galician dialect as being spoken in Galicia and in Portugal, as far south as Coimbra, in the tenth and eleventh centuries, after which the Portuguese grew into a separate and polished dialect, which was much in use for poetry among Galicians and Castilians as well as Portuguese. (Raynouard, *Grammaire Comparée*, 'Discours Préliminaire.')

In the 'Elucidação das Palavras, Termos, e Frases que em Portugal antiguamente se usárao,' 2 vols. fol., Lisbon, 1798, are other specimens of old Portuguese or Galician compositions. The original text of the 'Amadis de Gaula,' by Vasco de Lobeira, which is lost, was written in the same language.

The Catalonian dialect became early a literary language, and as such subject to fixed grammatical rules; it has its grammars and dictionaries, a great number of printed books, and a still greater number in MS. It had its historians; among others an anonymous historian of Catalonia, mentioned by Zurita in his 'Chronicas de Aragon;' Bernard de Sclot, who lived in the thirteenth century, and wrote a history of the principality of Catalonia and of the Aragonese kings subsequent to the junction of the two states; and King Jayme I. of Aragon, who wrote an account of his own reign, which has been published under the following title: 'Chronica o Commentari del gloriosissim e invictissim Rey Jacme Rey d'Aragó de Mallorques e de Valencia, Compte de Barcelona e de Urgell, e de Muntpellier, escrita per aquell en sa lingua natural, e treita del Archiu del molt magnifich Rational de la insigne Ciutat de Valencia, hon estava custodita,' Valencia, 1557. King Jayme also wrote a book 'de la Saviesa' 'on wisdom,' quoted by Nicolaus Antonio, in his 'Bibliotheca Vetus.' The Catalonian is rich in poetry, which was introduced into the Peninsula by the troubadours of Provence and Languedoc. Alonso II. of Aragon, in the twelfth century, is numbered among its poets, as well as Guillermo de Berguedan, a Catalonian noble, who lived in the following century, and some of whose verses are preserved in a MS. in the Vatican library. Mosen Pero March, Jacme March, Mosen Jorde, Mosen Febler, and Ausias March of Valencia, rank also among the Catalonian, Aragonese, and Valencian troubadours. [TROUBADOURS]

The languages of Aragon and Valencia, in the time of the Aragonese monarchy, may be considered as one and the same with the Catalonian. It is worthy of remark, that at the end of the 13th century, when the Castilian language had already gained the preponderance in a great part of Spain, we find a controversial conference between the Jews of Granada and some Christian missionaries from Castile, carried on in the Catalonian language, which appears to have been vernacular at Granada. (*Memoirs of the Royal Academy of Barcelona*, i., p. 615.) In the same Memoirs (p. 613) it is stated that the bishop of Orense, having been requested to examine what analogy there might be between the vulgar Galician and the Catalonian, answered, that there were in both, not only nouns, verbs, and other parts of speech quite identical, but also entire phrases. And Terreros (in his 'Paleography') and others have stated, that the language of Asturias is the same as that of Galicia, bating the difference of pronunciation.

The Catalonian, observes Raynouard, is the living language which most resembles the old Romance of the troubadours, and that of the Valdenses of Pignerol in Piedmont is the next. The following are among the shades of difference between the Catalonian and the Romance:—1. The Romance substantives and adjectives ending in *an*, *en*, *in*, and *un*, add in Catalonian the euphonic final vowel *y*: *affan*, *affany*, *estran*, *estrany*, &c. The plural feminine in *as* is changed into *es*. The Catalonian often changes the *s* into an *x*: *axi*, *puix*: it doubles the *l* at the beginning and at the end of words; *aquell*, *lloch*, *lluny*: it sometimes changes the *e* into an *i*, especially of the Romance participles in *ent*; *dormint*, *servint*, *fugint*, *premint*: it adds a final *u* to some inflections of the verbs, &c. The Catalonian has retained the affixes of the Romance, of which the following are specimens taken from the poems of Ausias March, the Valencian troubadour:—

Mostra m la llum de vera esperança,
Be ns mostra Deu lo mon que vol finir,
Tot mon parlar als que no m auran vista,
No solament los leigs qui t venen contra.

The popular patois or dialects of the south of France, after being long neglected, have of late years attracted the attention of philologists. Colomb de Batines has given an account of the patois of Dauphiné; Sainte Beuve has inserted a notice in the 'Revue des Deux Mondes,' vol. x., 1837, of the poems of Jasmin, the barber poet of Agen; a 'Recueil de Poésies Béarnoises,' was published at Pau in 1827. (The Bearnese dialect is a Romance and not a Basque dialect, and resembles the Gascon.) The dialect of Gascony has been illustrated by the Viscount de Métivier: 'De l'Agriculture et du Défrichement des Landes,' Bordeaux, 1839; and also by Du Mege: 'Statistique des Départemens des Pyrénées. The Languedocian boasts of two graceful poets brothers: 'Poésias Patouesas de P. A. et Cyr. Rigaud, Mounpeyé, 1806; 'Mêlanges sur les Langues, Dialectes, et Patois,' Paris, 1831; Beronie, 'Dictionnaire Patois,' Tulle, 1820; the poems of Verdié, a self-instructed artisan of Bordeaux, who died in 1820—whose works, full of humour and nature, are unknown beyond the precincts of his native town; an imitation of the fables of Lafontaine, in the dialect of Limousin, by J. Fouçaud, 1835; Brunet, 'Notices et Extraits de quelques ouvrages écrits en Patois du Midi de la France,' Paris, 1840; Millin, 'Essai sur la Langue et la Littérature Provençale,' Paris, 1811; J. Champollion Figeac, 'Nouvelles Recherches sur les Patois ou Idiomes vulgaires de la France, et en particulier sur ceux du Département de l'Isère, suivies d'un Essai sur la Littérature Dauphinoise, et d'un Appendix contenant des pièces en vers et en prose peu connues, et un Vocabulaire,' Paris, 1809; Grinet, 'Vocabulaire Limousin,' a dialect which resembles those of Franche Comté and Western Switzerland.

With regard to the antient Langue d'Oc, or Langue Romane, the most refined of all the southern dialects, but which may be considered now as a dead language, it was illustrated in the last century, in Italy, by Bastero, 'La Crusca Provenzale;' and in France, by L'Abbé Millot, 'Histoire Littéraire des Troubadours,' who compiled his work from the voluminous MS. folios of M. de Sainte Palaye. In the present century, Raynouard has been the most industrious and most successful investigator of the Romance language and literature.

In Italy, the dialect of the valleys of Pignerol, or of the Valdenses, has most affinity to the old Romance. [VALDENSES.] The Piedmontese, which is a written language, and is spoken by all classes of people, bears also considerable affinity to the modern Romance dialects of Southern France, and we have heard it stated that natives of Languedoc can understand those of Piedmont with ease [PIEDMONT] Dr. Pipino published a Piedmontese grammar, Turin, 1783; and Ponza published, in 1827-8, a Dictionary, Piedmontese and Italian. The language of Nice is also a corrupt dialect of the Langue d'Oc. [NICE]

With regard to the other North Italian or Lombard dialects, they differ more or less from the old Romance language, though they had a common and perhaps coeval origin with it, and resemble it more than the Italian or Tuscan. The Langue d'Oc, having been formed chiefly from a corrupt and provincial Latin, as well as the dialects of Italy, reduced its materials to a regular form sooner than they; and having become a polished and literary language, the Italians in their turn borrowed at second-hand from it. Raynouard, in his 'Grammaire Comparée,' observes that the dialect of Ferrara is one of those which has retained more completely the forms of the Romance with the least admixture. That of Bergamo comes perhaps the next in affinity: it often changes the *e* into *o*; for example, instead of *el*, *del* (Romance), it has made *ol*, *dol*. The dialects of Bologna and Mantua abound with contractions and aphæreses, which render them very harsh; they have taken away the *t* of the Romance terminations in *at*, *it*, *ut*. The Milanese has a broad pronunciation, and many double vowels, changing into *aa*, *ii*, and *uu*, the Romance terminations in *at*, *it* and *ut*; *veritaa*, *servii*, *avuu*, &c.: it also changes *re* into *er*; *noster*, *sepolcher*, for the Romance *nostre*, *sepolcre*

of the Venetian territory, with the exception
uli, are more remote from the Romance in their
are likewise still more so the dialects south
aines, or of Southern Italy. We cannot here
the multifarious subject of the Italian dialects,
ɔr the inquisitive reader to their grammars, vo-
ıd other works, and also to an article in the
urnal of Education, No. x., in which are given
composition in each; and also to an article in
Quarterly Review, No. ix., 1829, on the dialects
Italy.

ts of Western Switzerland, Vaud, Neuchâtel,
of Freyburg, and Lower Valais, and also of
retained to this day the name of patois Ro-
ıgue Romande. Western Switzerland, as far as
occupied in the decline of the Roman empire
ındians, a less rude tribe than the Alemanni,
ı Eastern Switzerland. The Burgundians shared
the native population of Roman, Helvetian, or
ce; they applied themselves to agriculture, and
ted themselves into a well regulated and or-
chy. They gradually adopted the provincial
they found in use in the country, and from the
' which several Romance dialects were formed,
ɔled those of the South of France that were
gh a similar process. Some of the dialects of
tzerland approximate in their inflexions to the
ench, or Langue d'Oil, whilst others, like that
n the canton of Freyburg, bear more affinity
ance of the south, and consequently to the
ɔecimens of both are contained in Stalder's
e,' and also in the collection of Ranz des
ı in German and Romance, 'Sammlung von
uhreihen und Volksliedern,' Bern, 1818. To
itzerland is divided, by language, races, and
German and Romande, and the Germans call
the general name of Wälschland.

untry of the Grisons, or antient Rhæti, one
people speak a language called Rumonsch,
Italian dialect of very antient formation, sup-
me to be derived from the language of the
'ho emigrated to those valleys about 600 years
is a mere conjecture. The Rumonsch is a writ-
, and books have been published in it. MSS.
centuries old existed at the end of the last
perhaps some still exist in the convent of
The dialect of the Engadina, or valley of the
Ladin: it has still greater affinity to the
mbard dialects. Specimens of Rumonsch and
ınd in the Appendix to Vieusseux's 'History of
' published by the Society for the Diffusion of
'ledge. Raynouard observes that the Rumonsch
ɛs and other essential forms of the Romance
ough it is disfigured by an admixture of North-
nic orthography and pronunciation. It often
he end of words; *filg*, *volg*, *haig*, *testamaing*,
ance *fil*, *vol*, *hai*, *testament*.

the appellation of Romance language in its most
ıse, all the languages and dialects of Western
is to say, of Italy, Western Switzerland, the
nce, and Spain, may be called Romance, being
ıtially from the Roman or Latin, and having
after the fall of the Western Empire. The
the Armorican or language of Lower Britanny
different family. The Walloon of Liège and
n are also Romance languages. The Valachian
others, though less perhaps in its gramma-
ıan in the etymology of the words. Raynouard
ıalogy existing between them all in their gram-
struction and etymology in his 'Grammaire
es Langues de l'Europe Latine.' But if we
d Romance in its more restricted sense, as
especially applied to the language of the trou-
Langue d'Oc, we must consider it as confined to
France, and the eastern provinces of Spain as
a; and it is there that we find its legitimate off-
e languages of Catalonia, Valencia, and Ma-
ı the Languedocian, Provencal, and Valdenses

d at the conclusion of his 'Grammaire Com-
e languages of Latin or Roman Europe, enu-
ıty-three special characteristics in the construc-
Romance language, most of which occur also in the other languages and dialects of Western and Southern Europe, which he styles 'Neo-Latin.' 1, The use of articles to determine the cases, instead of their being designated by the termination of the word as in Latin. This characteristic is found in all the modern languages derived from the Latin. 2 and 3 relate to the terminations of words, especially nouns, of which Raynouard gives comparative tables in the various languages. 4 is peculiar to the old Romance, but existed also in the Northern French till the fourteenth century. It consists in placing an *s* at the end of substantives in the singular, when they stand as subjects; the absence of the *s* shows they were used in the objective case. In the plural it was the reverse, the absence of the *s* designated the nominative. The Northern French dropped the *s* generally in the singular, and gave it to the plural without distinction. 5 refers to other terminations employed by the old Romance, especially in proper names, to distinguish the subject from the object. 6 concerns the gender of the adjectives. 7 concerns the degrees of comparison. 8 is on the Romance affixes representing personal pronouns, *ous*, *os*, *m*, *x*, which are also met with in the old French and old Spanish, and also in some rustic dialects of France, in the Catalonian, and in some north Italian dialects. 9, The pronoun *altre* as an expletive added to the personal pronoun. This has been adopted by all the Neo-Latin languages of Europe; *vous autres*, *vos otros*, *vos outros*, *voi altri*, &c. 10, Relative pronouns *qui*, *que*, *lo qual*. 11, The indefinite pronoun *om*, derived from the Latin *homo*, which the French has retained in *on*. The Spanish and Portuguese, which formerly employed *ome* in the same sense, have since substituted *se*, and the Italians *si*. 12 concerns the use in the conjugations of the auxiliary verbs *aver*, *ester*, and *estar*, which have been adopted, with some modifications, by all the other Romance languages. 13 and 14 concern the formation of the future and the conditional. 15 concerns the participles in *ut*, of which the French has made *u*. 16 concerns the double formation of participles of the same verb, such as *rot* and *romput*, *defet* and *defendat*, *eleit* and *elegit*, &c. 17, the compound passive formed of the auxiliary *esser* and the participle past, which has been substituted in all cases for the Latin simple passive form. 18 concerns the verbs used impersonally. 19, The infinitive with the negative, used as an imperative. The Italian has retained it: 'Non parlare:' speak not. 20, The various uses of the conjunction *que*. 21, Formation of adverbs from the feminine adjective by adding the affix *ment*, which has been adopted by all the other languages derived from the Latin. 22, The expletives *pas*, *mica*, *gaire*, &c., added to the negative particle to give it greater emphasis. This form is retained by the French in *pas*, and by the Italians in *mica* and *guari*. 23 concerns the appellations *Romans*, *Romance*, *Roumonch*, *Romanza*, which were used by the old French, Italian, Spanish, and Portuguese writers to designate their respective idioms; an appellation which serves to show their common origin.

The following specimens of the Lord's Prayer, in the various dialects which are nearest to the old Romance, may convey some notion of their respective shades of variation as well as of their common origin:—

Old Provençal, from 'L'Arbre d'Amor,' A.D. 1288.

Paire nostre que iest el Cels;
Ton nom tia sanctificat;
A nos venga lo teu regnat;
En la terra facha sia,
Quo el Cel, voluntat tia.
La Pa nostre cotidia
Huei nos dona, Dieus, de ta ma;
Remet so que nos te deuem,
Que nos als autres remetem;
De temptacio nos deffen;
Ens delivra de mal.

Modern Provençal, from a Collection of Dialects published at Paris, as quoted by Adelung.

Nouastre Paire que sias oou Ciele; que vouastre noum siegue santificat; que vouastre rouyaoume nous arribe; que voustre voulountà siegue facho su la terro, coumo din lou Ciele: dounas nou encui noustre pan de cade jou; pardounas noue noustrei ooufensos, coumo leï pardounan a n'aqueleï que nous an ooufensas; e nou leïssez pa sucoumba a la tentation; mai delivra nous doou maou.

Languedocian, from Adelung's 'Mithridates.'

Nostre Pero que tes au ciel, que vostre nôum siegue santifiat, que vostre reyno nous arribe; que vostra voluntat siegue facha, tant sur la terra que din lou Ciel; donna nous aujourd' ivi nostre pan quotidian; perdonna nous nostras ouffenças, couma naoutres las perdounan on d'aquelles que nous an ouffençat. Nous lesses pas sucoumba a la tentation; me delivra nous de maou.

Catalonian, from Bern. Aldrete. '*Del Origen de la Lengua Castellana.*'

Pare nostro que estau en lo Cel, sanctificat sea el vostre sant nom; vinga en nos altres el vostre sant reine; fasas la vostra voluntat axi en la terra como se fa en lo Cel. El pa nostre de cada die da nous lo gui: i perdonau nos nostres culpes, axi com nos altres perdonam a nostres deudores; i no permetau que nos altres caigam en la tentacio; aus desllibra nos de qualsevol mal.

Balearic of Mallorca, from Adelung.

Pare nostro que estau en los Cels; sia santificat lo vostro sant nom; vingue a nos altres el vostro sant regne; fases, Señor, la vostra voluntad aixi en la terra com se fa en lo Cel. El nostro pa de cada dia daunolos, Señor, en lo dia de vuy; y perdonaunos nostras culpas, aixi com nos altres perdonam a nostros deudors, y dellivraunos, Señor, de tot mal.

Valencian, from Hervas's Collection in Adelung.

Pare nostre que estas en lo Cel; santificad siga el teu nom; venga a nos el teu reine; fagas la teua voluntad aicsi en la terra com en el Cel. El pa nostre de cada die daunoste gui. Y perdonaunos les nostres deudes aicsi com nos otros perdonam a nostres deudores; y no nos deicses caure en la tentacio; mes lliuranos de mal.

Sardinian of Cagliari and other Towns, from Adelung.

Pare nostru qui istas in sos Quelos; Siat sanctificadu su Nomen teu; vengat a nois su regnu teu; fasase sa voluntat tua axi comen su quelu gasi in terra. Lo pa nostru de dognia die da nos hoe; i dexia a nos altres sos deppitos nostros comente nosateros dexiam als deppitores nostros; i no nos induescas in sa tentatio; ma livra nos de male.

Sardinian Rustic.

Babbu nostra sughale ses in sos Chelus, santufiada su nomine tuo; bengiad su rennu tuo; faciadsi sa voluntade tua, comenti in Chelo gasi in terra. Su pane nostru de ognie die da nos lu hoe; et lassa a nos ateros is deppidos nostrus gasi comente nos ateros lassaos a sos deppitores nostros; e non nos portis in sa tentassione; impero libera nos de su male.

Gallego or Galician, from Hervas's Collection, No. 295.

Padre nostro que estas no Ceo; Santificado sea o teu nome; venja a nos outros o teu renjo; fagase a tua voluntade asi na terra come no Ceo. O pan nostro de cada dia danolo oje; e perdonainos as nostras deudas, asi come nos outros perdonaimos aos nostros deudores; e non nos deixes cair na tentazon; mas libra nos de male.

Portuguese.

Padre nosso que stas nos Ceos, Sanctificado seja o teu nome; venha a nos o teu reino; sea feita a tua vontade assi nos Ceos como na terra. O pao nosso de cada dia da nos oje; e perdoa a nos, Senhor, a nossas dividas assi como nos perdoamos aos nossos dividores; e nao nos dexes cahir in tentaçao; mas libra nos do mal.

Valdenses of the year 1100, *from Leger.*

O tu lo noste Payre, local sies en li Cel; lo tio Nom sia sanctifica: lo tio regne venga; la toa voluntà sia fayta en ayma illi es fayta al Cel, sia fayta en la terra; dona nos la nostre pan quotidian enchoy; pardonna a nos li nostre debit e peccà, coma nos perdonnen a li nostre debitors o offendadors; non nos amenar en tentation; ma delivra nos del mal.

Modern Piedmontese. (*This dialect has adopted in a great degree the pronunciation of the northern or modern French.*)

Padre nöst, ch't ses in Ciel; Santificà sia l' tö nom; vegna a noi l' tö regn; s' fassa la tua volontà com in Ciel cosi in terra; dane encüe l' nöst pan di tut i di'; perdona a noi i nöst debit com noi perdonoma ai nöst debitor; lasne nen casché en t' la tentasion; ma librene dal mal.

Rumontsch of the Grisons.

Bap nos chi est n' ils tschels; fat sangt vegna teis nom; teis reginom vegna nan proa; tia voellga drainta s' ees in tschel, usché eir in terra; nos paun d' minchiadi da a nus hoz, e perdunains nos debitts sco eir nus ils perdunain als noss debittadurs; en 'nus manar in provamaint; mes spendra ons dal mal

ROMA'NO, GIU'LIO. [GIULIO ROMANO.]

ROMANS, a town in the south of France, in the department of Drôme, 10 miles north-east of Valence, on a cross road from that town to Grenoble, and 362 miles from Paris by Lyon, Vienne, and Valence. The town owes its origin to a monastery founded by St. Bernard, A.D. 837: in the sixteenth century it was the centre of a considerable trade in woollen cloth, which was exported even into Asia; but the religious wars of that period combined with the ravages of pestilence to diminish its prosperity. It is still however a place of considerable trade, and the activity which prevails in it contrasts strongly with the dulness of the neighbouring town of Valence. Romans is in a flat district on the right or north bank of the Isère, by which it is separated from the little town of Le Péage du Pizançon, now called Le Bourg-du-Péage, which is virtually a suburb of Romans, and is joined to it by a handsome bridge. Romans is surrounded with an antient wall flanked with towers and defended by a ditch: it is an ill-built town, destitute of any remarkable edifices, except the parish church, which was antiently the church of the monastery founded by St. Bernard. The population in 1831 was 7677 for the town, or 9285 for the whole commune; that of Le Bourg-du-Péage was 3095 for the town, or 3577 for the commune, making 10,772 for the two towns, or 12,862 for the commune. The manufactures of Romans are silks, woollen cloths, serges, and other woollen fabrics, worsted hose, and leather: there are oil-presses for walnut-oil, and lime and plaster kilns. The trade of the place comprehends wool, tow, hides, silk, nut-oil, liqueurs which are made in the district, excellent truffles, and wine. There are three fairs in the year. Hats and silk goods are made at Péage; where also are dye-houses for cotton and silk, tanyards, ropewalks, and cartwrights' shops. Péage has four fairs in the year. Romans has a high school and a tribunal of commerce. It was the native place of the unfortunate General Lalley. [PONDICHERRY.] The celebrated Hermitage wines are grown near Romans.

ROMANS, EPISTLE TO THE. The Epistle to the Romans has been almost universally admitted to be the work of St. Paul. The only sects which have disputed its genuineness are the Ebionites, the Encratites, and the Cerinthians, and these purely on doctrinal grounds, inasmuch as the doctrines of this Epistle were adverse to their own opinions. (Stuart's *Commen. on the Epis.*, p. 42.) Some modern commentators however have supposed that the Epistle properly ends with the fifteenth chapter, a supposition which may seem plausible from the want of connection between the last chapter and the rest of the Epistle. But this want of connection may be accounted for easily enough, without any such hypothesis. (Stuart, *Introd.*, p. 49.)

The verses 25-27 inclusive of this last chapter are in some MSS., as in the Codex Alexandrinus, made to follow ver. 23 of cap. xiv., and Griesbach and others give them this arrangement. But a doxology of so sublime a character as is contained in these verses does not seem a fit conclusion for a discussion about eating meats or abstaining from them, and accordingly Hug and others agree with the received text in placing them at the close of the Epistle. Some few MSS. omit them altogether. The words *I, Tertius*, &c., xvi. 22, imply that this chapter formed the end of the Epistle, and that the Epistle is *one*. There are however indications in the last chapter that the Epistle received several unimportant additions or insertions after it was in the main completed, according as any afterthoughts occurred to the writer, before it was finally dispatched.

With respect to the date of the Epistle, various years have been assigned to it, from A.D. 55 to A.D. 58. According to the most probable opinion, it was written towards the end of 57 or in the beginning of 58, when St. Paul was at Corinth, and on the point of setting out to Jerusalem with the 'contribution made by them of Macedonia and Achaia for the poor saints which were at Jerusalem' and in Judea. (Cap. xv., ver. 25, 26.)

The Epistle was dictated in Greek by the Apostle to Tertius, his amanuensis (xvi. 22), and conveyed to the church at Rome by Phœbe (xvi. 1), a servant or deaconess of the church at Cenchreæ, a place not far from Corinth

proof of the Epistle having been written from
is ven in xvi. 23, where St. Paul sends saluta-
ius, his host, and Erastus, the chamberlain of
Corinth. (Comp. 2 *Timoth.*, iv. 20, and 1 *Cor.*,
The position of this Epistle in the New Testa-
s not depend upon its date, for it is the seventh
of time, and is placed first, either from being
t and most comprehensive' of the Epistles of
, or from the importance of the church to
t was addressed. (Horne's *Introduct.*, vol. iv.)
spect to the origin of this church, we have no
information in the Scriptures. They do not tell
or by whom it was founded. The opinion that it
nded by St. Peter does not appear to rest on any
y evidence: the chief authorities for it are,
Adv. Hær., iii. 1) and Eusebius (*Chron. an.* 2
but if he had indeed preached the Gospel at
ich a circumstance would probably have been no-
the *Acts of the Apostles*, nor is it likely that St.
uld have made no allusion to it in this Epistle.
the most reasonable opinion on the subject is, that
el was first preached at Rome by 'the strangers
t city, the Jews and proselytes,' who were converted
s preaching at Jerusalem on the day of Pentecost
10); so that, like many other churches, that at
as at first composed of Jews, and gradually in-
by the admixture of Gentiles, till the whole
community there became so large and important,
faith was spoken of through the world.' The
combination and co-existence of Jews and Gen-
irts of one Christian church sufficiently explains to
reader the occasion and object of the Epistle.
s and pretensions on one side would be met with
r opposition on the other. (cap. ii. and xi.) The
e attached to the Mosaic institutes and the Le-
tes and distinctions between clean and unclean.
re impatient of subordination to or equality with
tiles, and wished to impose upon them a con-
to many points of the Mosaic ritual, especially
ircumcision, before they were admitted to a par-
in the privileges of the Gospel. The Gentiles, on
hand, disregarded (perhaps too contemptuously)
idices of the Jews, and were of course offended
pretensions to superiority, for which their fallen
afforded in the eye of the Gentiles no justification.
;ht not reflect with fairness on what the Jews con-
emselves to have lost by the publication of the
Such a position of parties, and such a state of
etween them, would naturally give rise to the divi-
l offences which occasioned some of the admoni-
l cautions contained in the hortatory portion of the
and the existence of it can scarcely fail to be
by a careful reader.

gument of the Epistle is mainly directed against the
prejudices of the Jews, viz. (1), their trust in the works
w, and particularly in the rite of circumcision, as if
hey were already justified, *i.e.* accounted righteous
;ht of God; an idea which led them to reject the
the Gospel: (2), a trust in their privilege, as
en seed of Abraham, which led them to consider
es as God's peculiar people, and to look down upon
iles as aliens.

oint which the Apostle endeavoured to establish in
le is briefly laid down in cap. i., ver. 10, where he
in opposition to the prejudices and pretensions of
, that 'the Gospel is the power of God unto salva-
ery one that believeth: to the Jew first, and also
reek.'

two things, as Mr. Young remarks, are contained
firmation:—

e perfect efficacy of the Gospel to salvation, for it
wer of God unto salvation, *i.e.* the means whereby
gs about the salvation of men; which indeed im-
inefficacy of the law for that purpose, whether that
or that of nature, by which the Gentiles were 'a
emselves.' (i., 19; ii., 14.)

The *universal* extent of this saving power is included
rds, 'to every one that believeth: to the Jew first,
to the Greek.'

postle therefore in this Epistle does mainly these
:—

ows the *inefficacy* of the law of Moses to salva-
26.)

2. He shows the perfect *efficacy* of the Gospel to the same. (iii., 28.)

3. He destroys the *exclusive* claims of the Jew to the benefits of this salvation. (iii., 29.)

4. He establishes the claims of the Gentiles to justification, or acceptance with God, without their being under any obligation to perform the law of Moses.

These four points are the chief topics of the three first chapters, but the Epistle (or rather, the argumentative portion of it) may further be broken up into three great divisions:—

1. Concerning justification: the first five chapters.

2. Concerning sanctification; or the helps afforded under the Christian dispensation to purity of heart and holiness of life. (chapters 6, 7, and 8.)

3. Concerning the rejection of the Jews: the 9th, 10th, and 11th chapters.

The remainder of the Epistle is chiefly taken up with exhortations and precepts on various subjects.

The preceding arrangement and division is in accordance with Young's 'Synopsis of the Argument of St. Paul's Epistle to the Romans;' but perhaps the best idea of its general character is given by Paley, who observes that the 'principal object of the argumentative part of it is to place the Gentile convert upon a par with the Jewish, in respect of his religious condition and rank in the divine favour. The Epistle supports this point by a variety of arguments, such as that no man of either description was justified by the works of the law, inasmuch as no man had performed them; and it became therefore necessary to appoint another medium or condition of justification, in which the Jewish peculiarity was merged and lost: that Abraham's own justification was antecedent to the law and independent of it: that the Jewish converts were to consider the law as now dead, and themselves as married to another: that what the law could not do, in that it was weak through the flesh, God had done by sending his Son: that God had rejected the unbelieving Jews, and had substituted in their place a society of believers in Christ, collected indifferently from Jews and Gentiles.' A doctrine of this sort was not however likely to be acceptable to the Jewish members of the Christian church; and accordingly we find that St. Paul makes every attempt to reconcile them to it; and whenever he says anything disparaging of them, invariably qualifies or softens it by a subsequent observation. Instances of this occur very frequently, and especially in the tenth and eleventh chapters.

(Young; Horne; Townshend; and Stuart. For examples of undesigned coincidence between this Epistle and the *Acts of the Apostles*, the reader is referred to Paley.)

ROMA'NUS I., an Armenian by birth, served with distinction under Leo the Philosopher and his son Constantine Porphyrogennetus, who made him great admiral. Romanus gave his daughter Helena in marriage to the emperor, who made him his colleague in the empire, A.D. 919. Romanus became in fact the real emperor, the weak character of Constantine not being equal to the cares of the state. His own sons however, whom he had named Cæsars, conspired against him, and having seized him, they confined him to a convent (A.D. 945), where he died in the year 948. His two sons did not reap the fruit of their unnatural treachery; they were seized by order of Constantine, and banished to a convent.

ROMA'NUS II., son of Constantine Porphyrogennetus, and grandson, by his mother's side, of Romanus I., poisoned his father, and succeeded him, A.D. 959. He showed himself as incapable as he was unworthy of the throne. After a reign of little more than four years, he died in 963, it is said by some of poison administered by his wife Theophana. His widow became regent and guardian of her infant children, and she soon after married NICEPHORUS PHOCAS.

ROMA'NUS III., of a patrician family and senator of Constantinople, was chosen his successor by Constantine IX., and the emperor gave him in marriage his daughter Zoe. He succeeded Constantine, A.D. 1028. The beginning of his reign was favourable, but he afterwards met with reverses, his armies having been defeated by the Saracens, and he became stern, avaricious, and unpopular. His wife Zoe, much younger than himself, having formed a guilty connection with an obscure individual called Michael of Paphlagonia, caused her husband to be murdered in the year 1034, upon which she married Michael, and placed him on the throne.

ROMA'NUS IV., DIOGENES, of a noble family, was a soldier under the reign of Constantine Ducas, and after that emperor's death was chosen by his widow Eudocia for her husband and her partner on the throne, A.D. 1068. [EUDOCIA.] He passed with an army into Asia, and carried on a successful war against the Turks, whom he drove beyond the Euphrates. Having afterwards entered Armenia, he was defeated by Alp Arslan, sultan of the Turks, and taken prisoner. He was kindly treated by his conqueror, and obtained his liberty by paying a heavy ransom. In the meantime a revolution had taken place at Constantinople, where Michael, son of Constantine Ducas, had risen against his mother, and shut her up in a convent. Romanus on his way homewards was seized by order of Michael, was deprived of his sight, and banished to the island of Prinkipos, in the Sea of Marmara, where he soon after died, A.D. 1071.

ROMANZOFF, or ROMANZOW. [CATHARINE II.]

ROMANZOFF, NICHOLAUS, COUNT, was the son of the field-marshal Romanzoff who became celebrated by his victories over the Turks under the reign of Catherine II. He was born in 1753, and appointed Russian minister at Frankfort on the Main in 1785. Under the emperor Alexander he was nominated minister of commerce. He introduced many liberal measures into his department, and it was owing to his exertions that the first Russian expedition round the world, under Krusenstern and Lisiansky, was sent out in 1803. In 1807 he was appointed minister for foreign affairs, and soon afterwards chancellor of the empire.* He accompanied the emperor Alexander to the interview with Napoleon at Erfurt in 1808, concluded the treaty of peace with Sweden in 1809, and that of peace and alliance with Spain in 1812, by which Russia formally acknowledged the constitution of the Cortes of Cadiz. In 1814 he left public life, and devoted his time and fortune to the promotion of literature, science, and education in his own country. Many important works were published at his expense, as for instance the diplomatic code of Russia at Moscow; the history of the Byzantine writer Leo Diaconus, edited by Professor Hase at Paris, and a Russian translation at St. Petersburg; the history of the Mongols and Tatars by Abulghazi, which was printed for the first time in the original Tatar at Kazan, 1825; and many other important publications relating not only to the political history of Russia, but also to that of its manners, customs, literature, and art. The scientific expedition round the world by Captain Kotzebue in the years 1815-18 was undertaken and the account of it was published at the expense of Romanzoff. He established on his estate of Homel in the government of Mohiloff, under the direction of an Englishman, Mr. Heard, the first Lancasterian and industrial schools in Russia. This patriotic individual died in 1826. He had never been married.

The Russian mode of writing his name is Rumiancoff, pronounced Roomiantzoff, but the form Romanzoff has been adopted in all foreign works.

ROMBOUTS, THEODORE, a painter, was born at Antwerp in 1597, and studied under Abraham Jansens until he was twenty years of age, when he went to Rome, and was soon known as one of the most promising young artists of his time. He obtained from a nobleman in that city a commission to execute a series of twelve pictures of subjects from the Old Testament, which, when completed, added greatly to his reputation. After residing at Rome a few years, and gaining constant employment, he was invited to Florence by the grand-duke of Tuscany, and executed for that prince several large historical works for the palace. After an absence of eight years, Rombouts returned to Flanders, and established himself in his native city in 1625. He was soon engaged to paint in the churches, and his pictures excited universal admiration. He was thus induced to believe that he could rival if not surpass Rubens, who was then in the full exercise of his astonishing powers. Rombouts made the trial, and though he did not succeed, his failure was unattended by disgrace. If his works do not possess the magnificence of his great competitor in their conception, nor his splendour and breadth of effect in their execution, they must be admitted to show a readiness of invention, a correctness of design, an animation of expression, a warmth and brilliancy of colouring, and a surprising facility of touch, which would have placed him, at another time and under other circumstances, at the head of his profession. The works which he executed in competition with Rubens were, St. Francis receiving the Stigmata; the Sacrifice of Abraham in the Church of the Recolets; and Themis with the Attributes of Justice, in the town-house of Ghent. The Taking Down from the Cross, in the cathedral of the same city, is a composition which proves that Rombouts possessed most of the qualities of a great master. In order to gain money, he did not hesitate to paint familiar subjects, such as concerts, assemblies, and merry-makings, which, though executed with taste and freedom, are far inferior to his other works. He also painted decorations for theatres. Having amassed a considerable fortune, he commenced building a handsome mansion, but had not proceeded far when he found his means to be inadequate, and he pretended that the grand-duke of Tuscany required his attendance at Florence, as an excuse for not proceeding with the edifice. The mortification of this disappointment is supposed to have hastened his death, which took place at Antwerp in 1637, according to Houbraken, and according to Weyermans in 1640.

(*Biographie Universelle*; Bryan's *Dictionary of Painters and Engravers.*)

ROME, ROMA, the head town of the Papal State, and formerly the capital of the whole Western world, is situated in the wide plain of the Campagna, on the banks of the Tiber, 15 miles from the sea-coast, in 41° 54′ N. lat. and 12° 28′ E. long. The Campagna about Rome is not a p like the flats of Apulia or Lombardy; it is a kind of table-land with a very undulating surface, crossed by groups ridges of low hills, and it slopes towards the south-west w a rapid descent to the alluvial marshy tract of the Maremma, which extends along the coast of the Mediterranean. [CAMPAGNA DI ROMA; MAREMMA.] The descent from the dry table land of the Campagna to the maritime plain occurs, as we follow the right bank of the Tiber, about ten miles below Rome, and two miles and a half above Capo due Rami, or the bifurcation of the Tiber. At that point the table-land is from 100 to 120 feet above the sea. On the left or southern bank the descent is nearer the bifurcation, above the Marsh of Ostia. [OSTIA.] Farther south-east, the villages of Pratica (the antient Lavinium) and Ardea stand on the edge of the slope.

The basin of the Lower Tiber, after the river emerges from the Sabine Hills on one side and Mount Soracte on the other, and enters the Campagna, partakes of the character both of the lowlands and the table-land, the immediate banks of the river being considerably lower than the surrounding country. The site of Rome consists partly of several strips of low land on both banks of the Tiber, the ordinary level of the river being there about 35 feet above that of the sea, and partly of the table-land of the Campagna, which rises on both sides from 150 to 200 feet above the river. The projections of this table-land which advance towards the river have been, perhaps improperly, called hills; and hence, the name of the Seven Hills. After the enlargement of the city walls by Aurelian, these hills or projections were considerably more than seven. On the right bank of the river, the Vatican and the Janiculus, which are within the modern city, are a continuation of the ridge of Monte Mario, which is outside of the walls to the north, and is 450 feet above the sea, and of Monte Verde to the south. On the left or eastern bank, the table-land of the Campagna extends, within the walls of Rome, in a semicircular shape, forming several projections to the west towards the river. The low grounds between these projections and the river constitute the Campus Martius, on which the greater part of the modern town is built. Beginning from north, the first projection of high lands within the town that called Monte Pincio (the antient Collis Hortulor ; farther east, and partly separated from it by a depression or ravine, is the Quirinal, and still farther south- Esquiline. In a kind of recess between the Quirinal and the Esquiline is a smaller projection, which has received the name of Mount Viminalis, but which is now hardly tinguishable from the other two. It rises above and no of the church of San Lorenzo Panisperna. The Quirinal, Viminal, and Esquiline are joined on the east, within the of Rome, by an extensive plateau, which is about 1 above the ordinary level of the Tiber, and which slopes ge towards the country outside of the walls of Rome. The highest points of the Esquiline and the Quirinal are nearly 200 feet above the Tiber. South of the Esquiline, and separated from it by a depression or valley, is Mount Cælius, which seems

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* The chancellorship is the highest civil rank in Russia, and the place is for life. It has nothing in common with its synonymous dignity in England; the chancellor of Russia is the head of the foreign department.

nsulated than the other hills already mentioned,
eastwards towards the country outside of Porta
i, and is also divided on the south from the
y the valley of the Aqua Crabra or Marrana.
space that is enclosed between the table-land
er, and in the middle of the antient city, there
ll insulated hills, the Palatine, the Aventine
ue Capitol, of which the Aventine is the most
d the Capitol the most northern. The Capitol
n the south-west extremity of the Quirinal and
k of the Tiber, and nearly fills up the interme-
The antient city of Rome, before the time of
y south and east of the Capitol, and along the
ventine, Cælian, Esquiline, and Quirinal hills:
lk of modern Rome lies north of the Capitol.
, on approaching Rome from the north, makes a
e east towards the base of Monte Pincio, reced-
nte Mario and the Vatican hill on its right
n reaching Ripetta within the city, the river
d to the westward, and flows along the north-
of Mount Janiculus, after which it turns again
s far as the base of the Capitol. It then turns
south-west, sweeping past the base of the
d along the southern extremity of the Janicu-
assumes a course south by east. The level
en the Vatican Mount, the north end of the
nd the right bank of the river, is the Vatican
is about a mile long from east to west. It con-
go or suburb of Rome, enclosed by the popes,
r's church, the Vatican palace, and their appur-
'he space between the long ridge of Mount
d the right bank of the Tiber constitutes the
anstevere, which is another suburb of Rome.
the left bank running north and south, and be-
eat westward bend of the river and the eastern
ite of the modern city of Rome, properly speak-
tends also along the slope of the Pincian, Qui-
the Esquiline, and the Capitol, forming a kind
f which the apex is to the north, at the Porta
nd the base extends from Santa Maria Mag-
east, to the Tiberine island on the west, a dis-
it a mile and a quarter, whilst from the Porta
the foot of the Palatine opposite Ponte Rotto,
southern point of modern Rome, the distance
e than a mile and a half. All to the south and
limits, forming about two-thirds of the area
lls, is desolate, consisting of ruins, gardens, and
ome churches, convents, and other scattered

it line of walls of Rome proper on the left bank
is generally understood to be that traced by
tored by Honorius, and afterwards by Belisa-
eo repeatedly renewed by several popes. It
rregular polygon, of which the longest diameter
in length from north-west to south-east, from
l Popolo to the Porta S. Sebastiano on the
. The whole circuit of the present walls, in-
of Transtevere and of the Borgo or Vatican,
urteen and fifteen miles. The wall is made of
with stones and rubbish, and has been often re-
aries in height, but in most places does not
it. It has no ditch, but is flanked by towers
, which were last repaired by Pope Benedict
e has sixteen gates, some of which however are
Beginning from the north is: 1. Porta del Po-
Flaminian way, or high northern road, which
a short distance from Rome, one branch
orence and the other to Ancona. 2. Farther
t gate is Porta Pinciana. 3. Porta Salara or
e road to Rieti. 4. Porta Pia, on the north-
Nomentana, the road from which joins the Via
orta S. Lorenzo, facing the east, and leading to
'orta Maggiore, leading to Palestrina: this is
est of the gates of Rome, being originally part
ct of Claudius restored by Vespasian and Titus,
sted by the triple inscription over it. It consists
which crosses the high road, built of Travertino
stone. 7. Porta S. Giovanni, which looks to the
the modern road to Albano and Naples. 8.
the road from which joins the Naples road.
bastiano, on the antient Via Appia. 10.
on the road to Ostia. Crossing the Tiber,
orta Portese, which leads to Fiumicino, the
present port of Rome. 12. Porta S. Pancrazio, on the summit of Mount Janiculus, which is nearly 300 feet above the Tiber. Outside of this gate is the Villa Pamfili, with its shady walks, its waterworks, and beautiful groves of lofty umbrella pines. 13. Porta Cavalleggieri, south-west of St. Peter's; it leads towards Civita Vecchia. 14. Porta Fabbrica, on the same side, is now walled up. 15. Port' Angelica, on the opposite or northern side of St. Peter's, on the road leading to Monte Mario. 16. Porta Castello, which opened from the Castle of S. Angelo northwards into the country, and is now walled up. Besides these, there are two internal gates, one called S. Spirito, leading from the Borgo to the Lungara, and the other Porta Settimiana, leading from the Lungara to Transtevere. These districts, Borgo and Lungara, have been consecutively annexed to the modern city.

The course of the Tiber within Rome, including its windings, is about three miles; the banks are not built up with quays or walks, but in most places the river is bordered by the backs of houses generally of an inferior sort; in other places there is a slip of sand or gravelly ground between the houses and the river, which is frequently overflowed. There are only two places where there is a sort of quay or landing-place; one in the northern part of the town, on the left bank, above the bridge of S. Angelo, called Ripetta, where the boats from the inland provinces on the upper Tiber land wine, charcoal, and provisions; and the other at the southern extremity of the town, on the right bank near Porta Portese, called Ripa Grande, where sea-vessels land their cargoes, and where there is a line of warehouses and a custom-house. There are three bridges across the Tiber within Rome; the northernmost is Ponte Sant'Angelo, the Pons Ælius, built by Hadrian, and restored by several popes, and lastly by Clement IX., by whose order Bernini constructed the present balustrade and the statues with which it is decorated. It is about 300 feet long, but the width of the bed of the river is not more than 200 feet The Ponte Sisto, formerly Pons Janiculensis, built originally by Marcus Aurelius, and rebuilt by Sixtus IV., is about 300 feet long, the bed of the river being 230 feet wide. About half-a-mile lower down is the island of San Bartolomeo, the antient Insula Tiberina. This island is of an oblong shape, something like a ship, being about 1000 feet long, and 300 feet wide in the middle of its length. It is joined to the mainland by two bridges; one to the left bank called Ponte San Bartolomeo; and the other to the right bank, called Ponte Quattro Capi, from a head of Janus Quadrifrons which once decorated it. The two arms of the river together form a bed of about 200 feet in width. There are also within Rome the remains of three antient bridges: the Triumphalis, called also Vaticanus, just below Sant' Angelo, of which the piers have fallen into the bed of the river and occasion a rapid; the Pons Palatinus, now called Ponte Rotto, of which three arches remain on the Transtevere side; and lastly, the Pons Sublicius, at the foot of the Aventine, the first bridge built by the Romans, of which there are very few vestiges.

Rome is divided into fourteen districts, called Rioni, which however do not correspond in their boundaries to the Regiones of the antient city. The modern Rioni are of very unequal extent, their boundaries being determined with reference to the population included within them. Thus the inhabited part of the city contains eleven Rioni, namely: 1, Campo Marzo, near Porta del Popolo; 2, Colonna; and 3, Trevi, along the slope of the Pincian and Quirinal; 4, Sant' Eustachio; and 5, Pigna, in the middle of the lower town, 6, Ponte; 7, Parione; and 8, Regola, near the left bank of the Tiber; 9, Sant' Angelo in Pescheria, between the Capitol and the Tiber; and 10, Transtevere; and 11, Borgo, on the right bank of the river. The whole of the antient or southern city is comprised within three extensive Rioni, namely: 12, Monti, on the north-east; 13, Campitelli, south-east; and 14, Ripa, south-west.

The modern town of Rome may be conveniently divided, for the sake of topographical description, into three great divisions: 1, the lower part of the town between the eastern hills, the Tiber, and the Capitol; 2, the upper town, which extends along the eastern hills; 3, the part of the town which is on the right bank of the Tiber.

The lower town, which occupies the site of the ancient Campus Martius and Campus Tiberinus, is the seat of all the bustle and trade. It is crossed in its central part from north by west to south by east by the street Del Corso, which is about one mile in length from the Piazza del Popolo, or great northern entrance of Rome, a handsome open place with an obelisk in the middle, to the palace of Venice, near the foot of the Capitol. Two other streets branch out from the Piazza del Popolo, on the right and left of the Corso, and at an acute angle with it. One leads south-east to the fine open place called Piazza di Spagna, the great resort of foreigners, at the foot of the Pincian Mount, after crossing which, it continues in the same direction to the College of Propaganda at the foot of the Quirinal. The other street, called Ripetta, runs in a south direction, parallel to the bank of the Tiber, and then, following the bend of the river, leads, under a different name, to the bridge of Sant' Angelo.

About the middle of the Corso is a square, called Piazza Colonna, from the antient pillar which stands in the middle of it. [ANTONINE COLUMN.] Immediately to the west of the Piazza Colonna is an irregular square, which crowns a slight eminence called Monte Citorio, or Citatorio, a small hill which rises in the middle of the Campus Martius. It contains a fine building, called Curia Innocenziana, in which the courts of justice sit: a handsome obelisk stands in front of it. Returning to the Corso, and following it southwards, we meet with a street on the left, which leads to the Fontana di Trevi, the handsomest fountain in Rome, and then we come to another street, leading to the ascent of the Quirinal, or Monte Cavallo. Farther up the Corso, on the right, is a wide street, called Strada del Gesù, which leads to the splendid church and convent of that name, the head-quarters of the Order of the Jesuits, from whence, turning to the left, is a street that leads to the foot of the Capitol. The whole of this part of the city, in the neighbourhood of the Corso, consists chiefly of regular and substantial buildings. The most remarkable are: 1. the Palazzo Borghese, near Ripetta, one of the largest and finest in Rome; it contains a choice collection of paintings, by Titian, Domenichino, Albano, Annibale Caracci, Caravaggio, Parmigiano, and other great masters. 2. Further north the old mausoleum of Augustus has been transformed into an amphitheatre, called Correa, for bull-fights, fireworks, and other popular diversions. 3. Palazzo Ruspoli, on the Corso, in a good style of architecture, by Ammanato, has a much-admired staircase, constructed by Martino Longhi, consisting of 115 steps, each of a single block of white marble. The extensive ground-floor of the palace has been converted into a coffee-house, which is the largest in Rome, and consists of various rooms, where several 'crocchi,' or clubs of lawyers, merchants, and other persons assemble, that of the contributors to the 'Giornale Arcadico,' the literary review of Rome, among the rest. The club of the artists is held at the Caffé del Greco, in the Piazza di Spagna; that of the antiquarians at the caffé of Fontana di Trevi; the club of professors and other men of letters meets at the Caffé di Monte Citorio. 4. Palazzo Ghigi, which forms the north side of the Piazza Colonna, contains some choice paintings, and a fine library rich in curious MSS., among others an inedited chronicle of the monastery of Mount Soracte; a copy of Dionysius of Halicarnassus, written in the eleventh century; several letters of Melancthon; one of Henry VIII. of England, concerning Luther; about twenty volumes of original documents relative to the treaty of Westphalia; a handsome parchment volume, in folio, containing French and Flemish music of the fifteenth century, &c. 5. Palazzo Piombino, on the opposite or south side of the square. 6. Palazzo Sciarra Colonna, on the Corso, has a rich collection of paintings and a handsome Doric marble gate. 7. Palazzo Doria, a vast building, designed by Borromino, also contains a gallery of choice paintings. 8. The Palazzo Torlonia, formerly Odescalchi, or Bracciano, on the Piazza S. Apostoli, has a splendid marble gallery fitted up in the modern taste, and some good modern paintings. 9. On the opposite side, next to the church of S. Apostoli, is the Palazzo Colonna, with a handsome court and gardens behind, which extend up the slope of the Quirinal, and a gallery of paintings with some splendid portraits by Titian, Veronese, and Giorgione. 10. The huge Palazzo di Venezia, so called because it once belonged to that proud republic, is now occupied by the Austrian ambassador; it looks like an old castle, with its massive walls and battlements. 11. Opposite the church of the Gesù is the Palazzo Altieri. All these palaces are in the immediate neighbourhood of the Corso. The principal churches in the same district are: 1. Santa Maria del Popolo, which, like most churches at Rome, contains some good paintings, several remarkable sepulchral monuments.
chapel belonging to the Ghigi family.
Corso. 3. S. Lorenzo in Lucina, raised on the rui
antient temple. 4. S. Ignazio, which is rich in o
adjoins the Gregorian or Roman College. 5. T
some church del Gesù contains some good and some im
paintings, the splendid chapel of S. Ignatius, enrich
lapis lazuli, silver, and gold, and the mausoleum o
mino, by Bernini. 6. Santi Apostoli, with the fine
leum of Pope Ganganelli, the work of Canova
twenty-five years old (which has been so gr
described by Milizia in his letters), and a cen
the same illustrious artist, to the memory of
the engraver Volpato. In the adjoining cloist
tomb of Cardinal Bessarion. 7. S. Marcello con
sepulchral monument of Cardinal Consalvi.
Maria in Vialata, &c.

West of the Corso, and between it and the
dense mass of irregular streets, a busy part of the
taining market-places, shops, and inferior dwelli
here and there a fine building. Towards the cent
district is the fine oval place called Piazza Navona
tient Circus Agonalis), one of the largest in Rome,
fountains, by Bernini, its three churches, and the
palace Braschi at one extremity of it. The universi
La Sapienza is in the neighbourhood. Between it
Corso is the Rotunda [PANTHEON], next to which
Palazzo Giustiniani, and on the other side of it is t
church and Dominican convent of La Minerva. N
the river are: 1. the Palazzo della Cancelleria, by Br
2. The Palazzo Farnese, the best-built in Rome,
square before it, ornamented by two handsome fo
some of the apartments are painted by Caracci,
Vasari, and others. Next to the Piazza Farnes
other square, called Campo di Fiore. 3. The Palazz
with a collection of antient sculptures, among ot
supposed statue of Pompey, and some very fine
lievos, found at Santa Agnese without the walls.
handsome church of Santa Maria in Vallicella, belo
the brothers of S. Filippo Neri, or Congregation of
toire [NERI, FILIPPO; ORATORIO], a most gentlema
assuming, and useful body of clergymen. The library
many valuable MSS., historical and ecclesiastical.
church Santa Maria dell'Anima has some good p
and the monuments of Pope Adrian VI. and of Lu
stenius, a Protestant converted to Catholicism, w
librarian of the Vatican. Holstenius was succeede
office by Allatius, a native of Chios, and Allatius
ceeded by J. Simonius Assemani, a Maronite.
terogeneous succession of librarians gave occasio
following distich, in the caustic humour of modern R

> 'Præfuit hæreticus; post hunc schismaticus; at nunc
> Turca præest: Petri bibliotheca, vale.'

Near the left bank of the Tiber, and parallel to it
handsome regular street, called Strada Giulia, abou
quarters of a mile long, from Ponte Sisto to Ponte
gelo. This district, though well built, is dull, wh
pared with the Corso and the adjoining streets.

South of Ponte Sisto, along the left bank of th
and extending round the western base of the C
the foot of the Palatine, is the lowest, meanest, and
part of modern Rome. It is partly occupied by th
who are cooped up to the number of 4000, in se
row filthy alleys, in rows of tall old houses, near
side, between Ponte Sisto and Ponte S. Bartolomeo.
are not allowed to live outside of their district, called
which is separated by a wall from the rest of th
They are not otherwise molested. They have their
and a synagogue, a sort of municipal council, their
support their own poor, and follow their customary
tion of buying and selling. The lower sort are
the streets of Rome, with their dingy bags, cr
vecchi,' old clothes. Some of the higher class
trade with foreign countries, and are regular
It has been observed that this district, low and
is remarkably healthy. Facing the Ghetto is the islan
Bartolomeo, with the church of that name, and an
kept by the philanthropic congregation commonl
the Ben Fratelli, from their motto, 'Fate bene,
('brethren, do good' to your fellow-men), which was
in Spain, about 1538, by S. Juan de D
vote themselves to attend on and nurse

Proceeding farther south, along the left bank of the
is a succession of narrow streets, extending to the foot
Palatine, with some of the most antient churches in
especially Santa Maria in Cosmedin, built in the
century of our æra, it is said, on the ruins of a temple,
ther sacellum, dedicated to Pudicitia Plebeia by Vir-
daughter of the patrician Aulus, who, having married
lebeian consul Volumnius, was excluded from the sa-
of Pudicitia Patricia. The conduct of Virginia on
ccasion, as represented by Livy (x. 23), is full of in-
. The church of Santa Maria in Cosmedin is adorned
two rows of fine antient columns. It is also called
della Verità, from a large stone mask with a large
h which is seen in the portico of the church, and the
f which is unknown. In the same neighbourhood are
hurches of S. Giorgio in Velabro, Santa Anastasia,
Maria Egiziaca, and of S. Teodoro, said to be on the
the temple of Romulus, on the Palatine, at the
extremity of the inhabited part of modern Rome, on
bank of the Tiber. Beyond it, the Aventine, Pala-
nd Cælian hills stretch to the south and south-east.
occupied with fields and gardens, and contain seve-
rches, convents, and scattered ruins.. The most re-
ble churches are: Santa Sabina and S. Alessio, on the
tine, and S. Bonaventura and its adjoining solitary
nt and garden, on the Palatine. The Cælian, an exten-
ill, has some interesting churches: 1. S. Gregorio, a fine
on the west slope of the hill, has splendid frescoes
nichino and Guido, representing the martyrdom
Andrew; a painting of Pope St. Gregory by Annibale
ci; and a statue of the same pope. Imperia, a kind of
rn Aspasia, rich, accomplished, and well informed,
ived in the age of Leo X., and was the friend of Bero-
Sadoleto, Campani, and other learned men of that
l, was buried in this church, where her epitaph was
een in the last century, but has been since removed,
nsequence of repairs. 2. S. Stefano Rotondo is an
t circular building, transformed into a church in the
entury, and is remarkable as exhibiting the various
in the history of the arts through the dark ages.
iovanni e Paolo, belonging to the Order of Barna-
in a fine situation, commanding a view of the Palatine
ventine, is much resorted to by persons religiously
ed, who retire thither for a time, and board in the
t, where they employ themselves in pious exercises,
quiet meditation, which the solitude of the spot
view of the majestic ruins before them are well
ted to assist. A solitary palm-tree rises in the
of the convent; there is another in the garden
Bonaventura, on the Palatine. No one has better
ibed the scenery of this part of Rome and the im-
on which it produces, than Madame de Staël, in
Corinne.' The Villa Mattei occupies a considerable
on the Cælian hill. The group of buildings connected
the Basilica of S. Giovanni, at the eastern end of the
is described under LATERAN. The Colosseum, tri-
arches, and other antient remains are noticed here-
Between the Lateran and the Colosseum is the
rkable antient church of S. Clemente.

th of the Aventine, and between it, the Tiber, and
alls, is a large space of low ground laid out in fields,
of which are common, and go by the name of 'Prati
'opolo Romano.' An artificial hill, called Mount
cio, rises on one side of them: it is formed of a
y of broken earthenware (testæ) and other rub-
which has been thrown and has accumulated here
antient times, and over which a green turf has
The modern Romans have excavated cellars in
of the hill, where they keep their wine cool, and
e is resorted to on holidays by the people of Rome,
y the lower orders, something like the tea-gardens
of London. On the other side, by the gate of S.
he Protestant burying-ground, and near it is the
of Caius Cestius.

upper town, or eastern part of modern Rome,
up the slope of the Pincian and Quirinal hills,
ccupies also part of the plateau which unites all
rn hills of Rome. This part is not so densely
lower town: it consists in great measure of
villas, of churches, convents, and other large
with spacious courts and gardens, and is inter-
two fine long streets, which cross each other
angles on the summit of the Quirinal, forming there a small circus, with a fountain at each bifurcation, from which the place has received the name of 'Le Quattro Fontane.' We shall briefly describe this part of the town, beginning from the north.

On the terrace or plateau of the Pincian Mount there is the fine new promenade or public walk, laid out during the French occupation. Next to it is the villa Medici, now the Academy of French pensionary artists; and the church of La Trinità de' Monti, and the esplanade with the obelisk in front of it, from which there is a splendid view of modern Rome. From this esplanade a good street, called Via Sistina, leads in a south-east direction to the Piazza Barberini, which lies in the depression between the Pincian and the Quirinal. The Palazzo Barberini, one of the largest in Rome, is at the east end of the Piazza. It contains a good collection of paintings, among others, the celebrated portrait of La Cenci painted by Guido, who had seen her on the scaffold at her execution. The library of the Barberini palace has about 50,000 printed volumes, and many valuable MSS., autograph letters, and other documents. [BARBERINI.] At the north end of the Piazza Barberini is the church and convent of the Capuchins, with its garden, which is kept in excellent condition, like all the gardens of the convents of that order; and adjoining them is the vast and splendid patrician villa Piombino, called also Ludovisi, from Cardinal Luigi Ludovisi, nephew of Gregory XIV. It has beautiful walks, and in the apartments of the principal casino is a valuable collection of antient sculptures, and also the fresco of Aurora by Guercino.

South of the Piazza Barberini rises the Quirinal Mount, which bears on its summit the extensive pontifical palace and gardens. At Rome it is commonly called Monte Cavallo, from the two colossal statues of Castor and Pollux, with their horses, which stand in the square before the palace. On the east side of the square is the Palazzo della Consulta, and next to it the Palazzo Rospigliosi, which occupies an extensive area. In a detached gallery or summer-house of the latter is the celebrated Aurora of Guido, which is considered the masterpiece of that great painter. A fine street, about a mile in length, leads from the square of the pontifical palace along the plateau of the Quirinal to Porta Pia, passing near the Thermæ of Diocletian. It is crossed at the Quattro Fontane by another street, leading from the Piazza Barberini to Santa Maria Maggiore, from whence several streets lead to Porta Maggiore, Porta S. Lorenzo, and Porta S. Giovanni. The magnificent church of Santa Maria Maggiore on the Esquiline hill, which here joins the Quirinal, is the eastern extremity of modern Rome. Beyond it, north, east, and south, the whole expanse of the Esquiline is occupied by gardens, villas, and fields, with some solitary churches. The more interesting of these churches are: 1, S. Pietro in Vincoli, built first by Eudoxia, wife of Valentinian III., and rebuilt by Pope Adrian I.: it contains the mausoleum of Julius II., with the statue of Moses by Michel Angelo. 2nd, The handsome church of S. Martino ai Monti, with its antient oratory and vaults, its modern embellishments, and the frescoes by Poussin, is worthy of notice.

Between the west slope of the Esquiline and the south slope of the Quirinal are several streets inhabited chiefly by the lower orders, which extend to the Campo Vaccino. Farther north, at the foot of the Quirinal, and in the gap between it and the Capitoline Mount, is the piazza which contains Trajan's column.

The Capitoline Mount and its buildings are described under CAPITOL.

The third great division of modern Rome, which lies on the right bank of the Tiber, consists of two distinct parts: Il Borgo, or Vatican, and Transtevere, properly so called, which are divided from one another by an inner wall. The Borgo, or Città Leonina, extends from the bridge of St. Angelo to the Place of St. Peter's. The group of buildings constituting St. Peter's and the Vatican palace are described under VATICAN. The other remarkable building in the Borgo is the great charitable establishment of Santo Spirito, the largest in Rome, situated close to the right bank of the Tiber. It comprises an hospital for the sick, which in the summer months contains from 1000 to 1200 patients at a time, a foundling hospital, and a lunatic asylum.

The castle Sant' Angelo (of which the massive circular tower was built by Hadrian for his mausoleum, and the fortifications around it, consisting of ramparts, ditches, and bastions mounted with cannon, were begun by Pope Boniface IX. and continued by successive popes) is the citadel of Rome, but it is not capable of a regular defence. It serves as a state prison and also as a house of correction.

The district called Transtevere lies south of the Borgo and between the Janiculus and the Tiber, and communicates with the Borgo by the handsome gate of S. Spirito. The Janiculus is a long straight ridge about a mile and a half long from north to south, and it rises nearly 300 feet above the level of the river. In the northern half of its length it rises almost immediately from the bank of Tiber, leaving however sufficient level ground for a street, which from its length is called La Lungara. This street contains some fine buildings, the Palazzo Salviati, the Palazzo Corsini, one of the handsomest in Rome, once the residence of Christina of Sweden, with a gallery of paintings, a library, and delightful gardens which extend up the slope of the Janiculus, and from which there is a splendid view of Rome: and lastly, La Farnesina, a house and gardens built by the wealthy banker Ghigi in the time of Leo X., with some fine frescoes by Raphael. On the slope of the Janiculus is the Villa Lante, the casino of which was painted by Giulio Romano. The church and convent of S. Onofrio, likewise on the Janiculus, above La Lungara, is worthy of notice, as having been the last asylum of Tasso, where he died and was buried. Another Italian poet, Guidi, is also buried at S. Onofrio.

Towards the southern end of the Lungara the hill recedes farther from the banks of the river, which here makes a bend to the east, and it is within this bend that the great bulk of the district called Transtevere is situated. Some of the streets run up the Janiculus to the gate of S. Pancrazio, but the higher part of the hill is chiefly unbuilt, though it is enclosed within the walls. The villa Spada is in this part, near the gate, outside of which is the villa Pamfili, a favourite promenade of the youth of Rome, with shady walks, waterworks, and clusters of lofty umbrella pines. Among the most remarkable buildings of Transtevere is the church of S. Pietro in Montorio, which contains some fine paintings, and in the cloisters an elegant circular temple by Bramante. Above S. Pietro in Montorio, in a commanding situation, is the fountain of L'Acqua Paola, the largest in Rome, which appears at a distance like a triple triumphal arch with streams of water rushing through: it was constructed by Paul V. with the marble taken from a temple of Minerva. Lower down, at the foot of the hill, is the collegiate church of Santa Maria in Transtevere, a vast and handsome structure, with granite and porphyry columns, rich marbles, some good paintings, and an old mosaic of the twelfth century. Near to it is the fine Benedictine convent of S. Calisto, in the library of which is a splendid Latin Bible of the ninth century, which is supposed to have belonged to Charlemagne, but from the illuminations it appears more probable that it was written for his grandson Charles the Bald. A long street leads from S. Calisto to the church and convent of S. Francesco a Ripa, once inhabited by St. Francis of Assisi. The church is ornamented with paintings, sculptures, and rich marbles, and has a chapel with vaults belonging to the the Pallavicini family. Not far from S. Francesco is the large building of S. Michele a Ripa, near the Tiber, facing the Aventine hill, which rises on the opposite bank. S. Michele is one of the most useful and best conducted charitable establishments of Rome, and is inhabited by above seven hundred persons. It consists of a work-house or house of industry for poor boys and girls, of a school of the fine arts for those boys who have a taste for them, of an asylum for the old and infirm of both sexes, and of a house of correction for juvenile offenders. Tournon, Valéry, and other recent writers agree in praising the arrangement, and regulation of this important establishment. Along one side of this vast building is the handsome quay and landing-place of Ripa Grande, where the vessels which ascend the Tiber from the sea land their goods, and annexed to which are warehouses. Below it is the Porta Portese, or gate leading to Fiumicino, which is the southern extremity of Rome on the right bank of the Tiber.

There are above three hundred churches in Rome, most of which are worthy of notice, either for their architecture or for their paintings and other ornaments. We have mentioned a few of the most interesting, and we refer to Vasi, Fea, and the other guide-books for further information. The churches constitute one of the principal attractions of modern Rome.

The palaces of the nobility form another class of interesting objects. It has been said sneeringly, that every house at Rome that has a 'porte cochère,' or carriage-gate, is called a palace: this may seem very witty, but it is nevertheless true that Rome contains many real palaces, buildings of princely magnitude and imposing style, containing vast courts and long ranges of spacious apartments, and it can boast of a greater number of these than any other capital in the world. In point however of interior comfort, neatness, or splendour, most of them are sadly deficient. The walls are of Travertino or Tiburtine stone, the pillars and staircases are frequently of marble and other costly materials; but the furniture is old, clumsy, and scanty; the floor of the apartment is often of unvarnished brick, and the curtains and tapestry are dingy, and a general want of cleanliness is frequently observable. The men-servants are often numerous in the hall, but they are dirty, lazy, and ill-paid. Passing through the long suites of vast and lofty apartments, you see here and there marble tables, fine paintings, and heavy gilt chairs, but nothing resembling the Parisian salon or boudoir, or the English drawing-room. The ground floor is either let as shops or used for coach-houses, stables, kitchens or other menial offices, and the windows are guarded with a strong iron grating, without glass behind it, which gives to the lower part of the building the appearance of a prison. Several of the Roman palaces are partly let to lodgers, and the owners occupy only one floor or part of a floor; the building being too large for any single family to live in, except such as a baronial family of the feudal times with its numerous dependants. The higher and wealthier Roman nobles however, the Borghese, Colonna, Doria, Rospigliosi, and others, still retain something of that feudal state, although they have lost their feudal jurisdiction.

The villas of the Roman nobility are more pleasant than their palaces. 'The modern villas, those splendid residences of the modern Romans, are like a connecting link between them and their proud predecessors of the classical times. The modern Roman palace differs greatly from the antient Roman house, but the villa resembles much what we read of the country-houses of the wealthy Romans of old. There is in both the same taste of magnificent retirement. The mansions of these villas have generally their front towards Rome, whose splendid horizon harmonises with the pomp of their architecture, and with the display of rich marble, statues, pillars, and vases and fountains with which they are decorated. The gardens are mostly regularly laid out, though not monotonous; they are not made, like the English parks, for the effect of scenery within, but to afford quiet walks from which to enjoy the splendid scenery without. Even in its solitary and often-neglected state, the Roman villa retains its antient classical character, and its melancholy appearance seems to add to its grandeur.' (Valéry, *Voyages en Italie*, xv. 1.) Several of the villas are within the walls of Rome, such as Medici, Piombino, Mattei, Corsini, and others which have been mentioned; others are outside of the walls, such as the Villa Pamfili, on the Janiculus; Villa Patrizi, outside of Porta Pia; and the Villa Madama, upon Monte Mario, so called from Margaret of Austria, a natural daughter of Charles V., who was married to Ottavio Farnese, duke of Parma. The house was designed by Raphael, and executed by Giulio Romano, who painted the loggia as a hall. The Villa Albani, although shamefully plundered by the French republicans in 1798, on the plea that its then possessor was, naturally enough, their political enemy, has still retained or recovered so much of its inexhaustible treasures as to be reckoned the third museum of antiquities in Rome, and next to the Vatican and the Capitol. In the time of its full splendour it was Winckelman's great study, which he illustrated in his 'Storia dell' Arte' and his 'Monumenti Inediti.' The great boast of the Albani museum is that its collection is all choice, while most other collections contain a great deal that is bad. Cardinal Alessandro Albani, who created this noble villa and its still nobler museum towards the middle of the last century, made it the business of his life; he was a man of taste and an enthusiast for antiquity and the fine arts. Among the finest sculptures are, the rilievo of Antinous, the Thetis found in the villa of Antoninus Pius at Lanuvium, the Minerva, the Jupiter, the Apollo Sauroctonos, Diogenes in his tub, the two Caryatides representing Grecian basket-bearers, the bassi-rilievi of the triumph of M. Aurelius, and others.

The Villa Borghese, on the Pincian Mount, outside of the walls, is well known for its gardens, which are laid out

lish style, its laurel and myrtle groves, its fine
iter, its temple, and hippodrome. The fine mu-
tient sculptures was sold or given up for a con-
y the late prince to Napoleon, his brother-in-law;
een partly replaced by new acquisitions. Of all
us quantity of works of art carried away by the
m Rome, only a small part has been restored;
purloined by private individuals and sold, much
rably damaged in the removal. The Borghese
has remained in the Louvre, being a purchase;
ndid collection of coins and gems, taken from
entirely exempted from the claim of restitution
ty of Paris.

ierous handsome fountains form another peculiar
f modern Rome as works of art, independent of
y. Rome is better supplied with good water
ontinental towns, and was much more abundantly
antient times. Of the antient aqueducts, three
ue to carry water into the town, having been
the popes. The first is that of the Acqua Ver-
est in quality, which comes from near the antient
urteen miles north of Rome: it supplies a great
lower town, and feeds thirteen public fountains,
ose of Trevi, of La Barcaccia in Piazza di Spagna,
Navona, and Farnese, are the principal. The
the Acqua Felice, the antient Aqua Marcia and
stored by Pope Sixtus V. (Felice da Montalto):
om the east, and supplies the upper or eastern
town, and feeds twenty-seven public fountains,
iat of Moses, near Porta Pia, that of Triton in
Barberini, and that of Monte Cavallo, are the
The third aqueduct, called Acqua Paola, the
sietina, enters Rome by Mount Janiculus, and
th Transtevere and the Vatican, feeding the Fon-
ia, and the splendid fountains before St. Peter's:
Ponte Sisto by conduits, it supplies the adjoining
nd the neighbouring district of Strada Giulia.
oserves that the supply of water thus carried into
nuch greater than that carried by the Canal de
o Paris for the supply of a population six times
that of Rome.

isks which adorn most of the squares of Rome
r peculiar feature of this city. An account of
en under **Obelisk**.

ets of Rome are generally narrow, like those of
ities, but many of them are straight and regular,
reat number of open spaces, such as squares,
dens, large courts, &c., render the town gene-
The pavement of the streets is made of
iall cubes of basaltic stone, not very agreeable to
, especially as there are no footpaths except
Corso. The streets are lighted at night with oil
ome possesses a great advantage over many con-
wns, in being provided with a regular system of
tly antient and partly modern. [**Cloacæ**.]

er town is subject to occasional inundations from
which sometimes rises, in seasons of extraor-
ns, from 25 to 30 feet above its ordinary level,
onsiderable part of the town is hardly 20 feet
level. In 1530 the river rose above 40 feet, and
iction which it caused is described by Baldi, in
La Nautica.'

nate of the city of Rome has been of late years
of much discussion. In the time of the republic
considered healthy when compared with the
g country. Parts of Latium were unhealthy in
me, and probably long before him; and the un-
s was greatly increased by the depopulation of
ry, the consequence first of the wars between
its immediate neighbours, and afterwards of the
in the last century of the republic. Tillage
was abandoned, and the country became divided
few large proprietors, who turned fields into
ounds. 'Propter avaritiam ex segetibus fecit
s Varro, speaking of one of these proprietors;
observes that 'Latifundia perdidere Italiam.'
proved that tillage cultivation and a dense popu-
k the increase and spread of the malaria. The
ilation of antient Rome and the elevated position
city, with the plentiful supply of wholesome water,
nience of sewers, and other circumstances contri-
aintain a tolerable state of salubrity within the

Cicero remarks the good choice of those who built Rome in the most favourable spot in the midst of a generally unhealthy region. (*De Republ.*, ii. 6.) Horace however (*Epist.* i. 7) complains of the fevers which prevailed in the month of August. The improvements made by Augustus, and the reconstruction of the town after the great fire in Nero's time, seem to have had a good effect on the salubriousness of the city, and Frontinus (i. 18) observes that the increased supply of water by means of additional aqueducts had contributed to render the atmosphere purer than it was in the old times. After the fall of the Empire, and the ravages committed by the barbarians, we read of the complete desolation of the Campagna during the dark ages, and of the abandonment of Porto, Ostia, Ardea, and other neighbouring towns in consequence of the malaria. At the same time a gradual removal was taking place within the walls; the population, which was much diminished, was leaving the southern part of the city for the northern, the hills for the plain of the Campus Martius.

As the southern hills, the Cælian, Aventine, Palatine, and Esquiline, became abandoned, they became also unhealthy, for populousness and salubrity go together in the whole Maremma region. In the eleventh century Petrus Damianus (*Epist.*, xix., 'Ad Nicolaum II., Pontificem'), draws a fearful picture of the epidemic fevers to which Rome was subject. But still the unhealthiness of the old city was, and is, much less in degree than that of the country without the walls, and especially of the lowlands towards the sea-coast. There are families and whole religious communities that live all the year round on the desolate hills of old Rome without any remarkable inconvenience, though no one would venture to spend the summer months, at least from choice, outside of the walls between Rome and the sea. The miasmata which produce the malaria, emanate from the volcanic soil of the Campagna acted upon by the rays of a burning sun; they seem to be of a dense heavy nature, seldom rising very high above the ground, unless wafted by the winds. Walls appear to stop their advance, fire dispels them, house foundations and pavements prevent their emanation. For an investigation of this curious subject see Brocchi, 'Stato fisico del Suolo di Roma;' Tournon, 'Etudes Statistiques sur Rome,' and an article on Tournon's book, in the 'Foreign Quarterly Review,' xxi., January, 1833, and the article **Campagna di Roma** in this work.

It seems now proved that whenever the population has decreased within Rome, from political and other causes, the air has become less wholesome, and that the thinly inhabited districts are, independently of their situation, unwholesome in summer, when compared with the more populous parts of the town. Thus the neighbourhood of the Corso and the lower town in general, and even the low filthy quarter of the Jews, are salubrious, whilst the eastern part of the fine street of Porta Pia, the neighbourhood of Santa Maria Maggiore, and that of the Lateran are considered unhealthy in summer, although they are on comparatively high ground. The parts of the Quirinal and the Pincian which are built upon are the most desirable situations in modern Rome for fresh air and health. On the other side of the river, the thinly-built district of La Lungara and the Vatican are considered unhealthy in summer, whilst the densely peopled part of Transtevere is less complained of.

It has been stated by some writers, but not upon sufficient grounds, that the malaria is encroaching upon the inhabited part of Rome, so as to threaten in course of time the depopulation of the whole city. Châteauvieux, who, we believe, was the first to start this theory, mistook the effect for the cause. He visited Rome at two different periods; first in 1791, when 'the city contained 166,000 inhabitants, the streets were thronged with sumptuous equipages and liveries, and the splendid palaces were open to the gaze of strangers—everything in short had an appearance of opulence and splendour.' But a few years afterwards came the French invasion of 1798, with its wholesale spoilations, forced contributions, and oppression of every sort, which no one has more honestly condemned and deplored than Count Tournon, after which the Papal State was reduced to one half, and the poorer half, of its territory. After a few years more of a precarious existence, the Papal Government was again upset by Napoleon in 1809, and the cardinal prelates, the foreign ministers, and a number of noblemen and other persons were driven away from Rome; numerous families were deprived of their accustomed means of support, and the whole social system was violently overturned. The population then dwindled apace, and in 1810 it was 123,000, of which no less than 30,000 were on the poor-lists made out by the rectors of the respective parishes. (Tournon, vol. ii., p. 136.) It was under these circumstances that Châteauvieux visited Rome a second time in 1813. 'I entered the city by the same road as before (by the Corso), but instead of equipages, I saw it filled with droves of cattle, goats, and half-wild horses, driven along by a number of Tartar-looking herdsmen armed with long spears and covered with dark capotes. The population is now reduced to 100,000, and of this number one-tenth part are vine-dressers, herdsmen, or gardeners. The city presents everywhere the appearance of ruin. As there are more houses than inhabitants (he means families), the houses are not repaired; when they get out of order, the occupiers remove to others. A multitude of convents have assumed the appearance of ruins; a number of palaces, no longer inhabited, are left without even a porter to take care of them.' (*Lettres écrites d'Italie.*) And yet, though he had the recent history of the country before his eyes, Châteauvieux attributed this depopulation and decay to the advance of the malaria. The fact is, that wherever the population gets thin and miserable, the malaria will gain ground; it will take possession of houses and gardens from which the warmth of the blazing hearth, and the cheering breath of human life, and the cares of domestic industry have disappeared. (See on this subject an article 'On modern Books of Travels in Italy,' in No. VIII. of the 'Quarterly Journal of Education.') The population of Rome has rapidly increased since the peace of 1814; by the census of Easter, 1838, it amounted to 148,903 inhabitants, exclusive of 4500 Jews. (Serristori, *Statistica d'Italia.*) An account of its distribution, social occupations, habits, and other moral features comes under another head of this article.

The temperature of Rome is generally mild and genial; frosts occur in January; but the thermometer seldom descends lower than 26° of Fahrenheit, and the midday sun generally produces a thaw. The tramontana, or north wind, sometimes however blows cold and piercing for days together. Snow falls at times, but it seldom remains on the ground for more than a day. Orange-trees thrive in the open air, but lemon-trees require covering during the winter months. Rains are frequent and heavy in November and December, but fogs are rare. In the summer months the heat is at times oppressive, especially when the scirocco, or south wind, blows. The hour which follows sunset is considered the most unwholesome in summer, and people avoid exposure to the open air.

The sky of Rome has been admired by most travellers for its soft transparent light, its ultramarine blue tinge, and the splendid colours of the sunset, which Claude has so well rendered. The general scenery of the country, the purple hue of the mountains, and the long waving lines of the plain of the Campagna, are noticed under ALBA LONGA. Within the walls of Rome there are many fine points of view. From the tower of the Senatorial Palace on the Capitol, there is a good panorama of Rome, embracing both the old and new towns; from the terrace of La Trinità de' Monti is a fine western view of modern Rome; there is another view from the Janiculus, in an opposite or eastern direction; and lastly, from the gallery above St. Peter's dome is a splendid and extensive panorama, embracing the whole town, the Campagna, the distant mountains, and the long line of the blue sea.

For the better understanding of the topography of Rome, the large map of Nolli, the atlas which accompanies Bunsen's 'Beschreibung der Stadt Rom,' or the small map by the Society for the Diffusion of Useful Knowledge, may be consulted. The map in Brocchi's work above mentioned gives a good idea of the surface of the ground.

TABLE OF SOME OF THE MORE REMARKABLE MODERN BUILDINGS IN ROME.

[The dates are to be considered only as approximations to the time when the respective structures were either commenced or in progress.]

Date.	Building.	Architect.
1375	Santa Maria sopra la Minerva, the only Gothic church in Rome	
1400	Santa Maria dell' Anima	
	Castel S. Angelo, restored	
1432	Church of Spirito Santo	
1440	S. Stefano Rotondo restored	
1450	S. Francesco	L. B. Alberti.
1460	Palazzo di Venezia	Giul. di Majan
	Santa Maria del Popolo	Baccio Pintelli.
	S. Pietro in Montorio	
	S. Pietro Rotonda in do.	Bramante.
	Hospital S. Spirito	
	Cloister SS. Apostoli	
1468	S. Marco	Giul. di Majan
1494	Cancelleria	Bramante.
.	Cloister Santa Maria della Pace	Bramante.
1500	S. Pietro in Vincoli restored	
1505	Palazzo Sora	Bramante.
1506	St. Peter's begun	Bramante.
	Palazzo Giraud	Bramante.
	Palazzo Chigi	Bald. Peruzzi.
	Palazzo Palma	Ant. Sangallo.
	Santa Maria di Loreto	Ant. Sangallo.
	Farnesina	Bald. Peruzzi.
1513	Palazzo Caffarelli	Raphael.
	Palazzo Linotti	Bald. Peruzzi.
	Villa Madama	Giul. Romano.
	Palazzo Strozzi	
1526	Palazzo Massimi begun	Bald. Peruzzi.
	Palazzo Cicciaporci	Giul. Romano.
	Palazzo Cenci	Giul. Romano.
	Palazzo Lanti	Giul. Romano.
	Madonna dell' Orto	Giul. Romano.
	Palazzo Serlupi	Giac. della Po
	Palazzo Niccolini	Ditto.
	S. Spirito, façade	Mascherino.
	Palazzo Farnese	Ant. Sangallo. M. A. Buonarr
1550	Villa Giulia begun	Vasari. Vignola.
1556	Palazzo Ruspoli.	Ammanati.
	Il Campidoglio	M. A. Buonarr
1560	Palazzo Lancellotti	Pirro Ligorio.
	Palazzo Nari	Vignola.
1564	Palazzo Spada	Mazzoni.
	Palazzo Negroni	Ammanati.
	Palazzo Mattei	Ammanati.
	Santa Caterina de' Funari	Giac. della Por
	Collegio Romano	B. Ammanati.
1576	Collegio della Sapienza	Giac. della Por
	Villa Pia	P. Ligorio.
1580	Villa Negroni	Dom. Fontana.
	Capella Sestina, in Santa Maria Maggiore	Dom. Fontana.
	Palazzo Altemps	M. Lunghi.
	Palazzo Giustiniani	Giov. Fontana.
1586	Obelisk in front of St. Peter's erected by	Dom. Fontana.
1595	S. Andrea della Valle.	Olivieri.
1595	San Michele in Sassia.	
1602	SS. Apostoli rebuilt	Rainaldi.
1603	Collegio Mattei	
	Palazzo Rospigliosi	
	Villa Borghese	Bernini.
	Palazzo Sciarra	Ponzio.
1608	Capella Borghese (Sta. Maria Maggiore)	Ponzio.
1612	Aqua Paolina	
1614	St. Peter's façade completed.	C. Maderno.
	Palazzo Verospi	Onorio Lunghi.
	Palazzo Propag. Fide	Dom. Fontana.
1618	Palazzo Altieri	Rossi.
	Villa Ludovisi	Bernini.
	San Carlo	Onor. Lunghi.
	Collegio Nazareno	
	S. Andrea del Noviziato	Bernini.
	S. Francesco di Paola	
1640	Palazzo Barberini	Maderno. Bernini. Borromini.
	Palazzo Mattei	Borromini.
1642	Palazzo Madama (di Governo)	Maruscelli.
	Palazzo Pamfili	G Rainaldi.
	Santa Agnese	G. Rainaldi.
	Curia Innocenziana	Bernini. Carlo Fontana.

Building.	Architect.
Santa Maria, Via Lata	P. da Cortona.
Palazzo Doria	
Colonnades of Piazza San Pietro finished	Bernini.
Palazzo Altieri	Rossi.
Palazzo Odelscalchi	Bernini.
S. Giov. de' Fiorentini	A. Galilei.
Capella Corsini	A. Galilei.
Palazzo Corsini	Fuga.
Pal. Consulta (now barracks)	Fuga.
Teatro Argentina	Marq. Teodoli.
Lateran Church, façade	A. Galilei.
Fontana Trevi	N. Salvi.
Palazzo Corsini restored	Fuga.
Santa Maria Maggiore, façade	Fuga.
Hospital S. Spirito enlarged	Fuga.
Villa Albani	
Palazzo Petronj	Fuga.
Convent S. Agostino	Vanvitelli.
New Sacristy St. Peter's begun	Carlo Marchionni.
zo Braschi	
o Pio Clementino	M. A. Simonetti.
Excavations of the Forum commenced	
rch of Constantine excavated	
emple of Venus and Roma excavated	
he Pillar of Phocas discovered	
asilica San Paolo fuor delle Mura burnt, restored by	Belli.
ew Buildings of the Piazza del Popolo	Gius. Valadier.
Andrea delle Fratte, façade	
alazzo Ceccopiero	Luigi Poletti.
ost-office, Piazza Colonna	
useo Gregoriano, Vatican, opened	

NCIPAL ANTIENT ROMAN BUILDINGS OF WHICH THERE ARE REMAINS.

Baths.

of Titus, hastily constructed near the Flavian eatre, about A.D. 80, on the site of the gardens of n house of Nero. The ruins stand now in a vine-ed in Nolli's map Sinibaldi, on a spot circum-y the modern street of the Polveriera and the street losseum; they occupied a space of about 400 feet The baths of Titus were however absorbed in rajan.

f Trajan, partly on the same site, and adjoining Titus, were commenced by Domitian and finished : they were more extensive than those of Titus, led towards the church of S. Pietro in Vincoli, y almost touched. They appear, from an inscrip-ve been embellished by Julius Felix Campanianus, f Rome. These are the baths of which Vasari the circumstance, in the Life of Giovanni da excavations being made near S. Pietro, and the of the pictures and stuccoes, which so much th Giovanni and Raphael that they imitated them besques of the Vatican. Palladio made a plan of s. The plan of the baths of Trajan resembles those of Diocletian: it occupies an area of about by 800.

the great hemicycles near the northern angle still On the shorter sides, near the eastern and angles, are the remains of two hemicycles with statues. The long side opposite the Colosseum n the centre the remains of a great semicircular

re few, and those few are unintelligible, remains ternal part of the building. Part of the use of Nero remains under the baths of Trajan. es and chambers of this house there are still arabesque decorations, the colours of which in are still very vivid.

Constantine, were, according to Victor, in the on, or in that of the Quirinal. The remains, which were extensive, appear to have stood on the boundary of the Quirinal, on the ground now occupied by the palaces of the Consulta and Rospigliosi. Buffalini, in his map (1551), places them near the church of S. Silvestro, on the Monte Cavallo. Some slight traces of these baths still exist in the Villa Aldobrandini. They were erected probably about A.D. 326, and were repaired in the middle of the fifth century by Petronius Perpenna and Magnus Quadratianus. In 1519 some of the ruins were still in existence, but they disappeared about 1527.

Palladio restored the plan, and in the reign of Clement XII. an excavation was made on their site, when a magnificent portico, with an ornamented ceiling, and walls painted with historical subjects, were discovered.

Baths of Diocletian, situated on the Viminal, and erected by Diocletian about A.D. 302. They were of vast dimensions. The extensive and capacious ruins were adapted to the purposes of a monastery, and M. Angelo transformed the antient tepidarium, the caldarium, and a part of the frigidarium into a church with its dependencies. The church is called Santa Maria degli Angeli. The rest of the ruins consist of large brick masses with arches of enormous span; some of these masses still support parts of the vaulted ceiling. On a part of the site of the baths M. Angelo constructed a spacious and elegant cloister.

Baths of Agrippa, were enclosed within the space circumscribed by the square of the Rotunda or Pantheon, the street of the theatre called Valle, the street of the Stimmate, and that of Gesù. They occupied a space about 500 feet from east to west, and 700 from north to south. According to Dion Cassius, they were constructed A.U.C. 729. The temple called the Pantheon has been sometimes considered a part of these baths.

Baths of Nero, situated on the ground which stretches from east to west between the square of the Pantheon and the square called Madama, and from north to south between the church of S. Eustachio and the street of the Coppelle. Eusebius fixes the date of their construction, A.D. 65. They appear therefore to have been commenced in the year of the great fire of Rome in the reign of Nero, and during the consulate of Quintus or Caius Lecanius Bassus and Marcus Licinius Crassus Frugi. One hemicycle alone of these baths exists in the inn of the Piazza Rondanini.

Baths of Alexander. An anonymous author quoted by Mabillon states that these baths stood between the Piazza Navona, the church of S. Eustachio, and the Pantheon. They were therefore contiguous to the baths of Agrippa. The baths of Alexander were built, according to Eusebius, in the year 229, and, according to Cassiodorus, in 227. They appear to have been an extension of the baths of Nero, as those of Nero probably were an extension of those of Agrippa.

Baths of Caracalla. Commenced about A.D. 212, and continued by Elagabalus and Alexander Severus. They are situated on a prolongation of the Aventine, not far from the gate of S. Sebastian. They are perhaps the most extensive ruins in Rome; but being stripped of their marbles, columns, stuccoes, and paintings, they consist only of vast and lofty walls, corbels, and niches of brick and tile, and for the ordinary spectator possess in this dilapidated state little interest. [BATHS.] At the extremity of the great platform the constructions are still tolerably perfect, as well as part of the castellum in a neighbouring vineyard. The ruins stand in three separate vineyards.

Temples.

Temple of Romulus. Erected by Maxentius to the memory of his son Romulus. These ruins, which are vulgarly called the stables of the Circus of Caracalla, are situated in a large quadrilateral enclosure forming part of the villa of Maxentius on the Appian way, and about one mile from the gate of S. Sebastian. From two medals of Romulus we see this building as it appeared at two separate periods: one medal represents the building with a dome, and without a portico; the other with the addition of a portico. It may have served both for a temple and a tomb. The lower part or basement is purely sepulchral, with niches for the sepulchral urns. The ceiling is vaulted, and supported by a huge central pier.

Temple of Bacchus. At what time first constructed is uncertain. The tetrastyle portico of four Corinthian white marble columns is an addition, taken from some other edifice, probably about the time of the Antonines. These columns have been walled up, and form part of the modern church to which the cella has been adapted. In the reign of Urban VIII. a circular altar with a Greek inscription was found in the subterranean part of this edifice, to the left on entering. The internal part of the cell is adorned with a stucco frieze representing military trophies; the vaulting is adorned with sunk octagonal pannels; slight traces of a bas-relief remain in the centre of the ceiling. These ornaments are in a good style.

Temple, called that of the *Divus Rediculus*. Built in commemoration of Hannibal's retreat from Rome, and situated in the same valley as the Nymphæum of Egeria, about a mile from Rome, and close to the little brook called Almone. At what time it was constructed is unknown, and the name of the temple of Redicolo is probably founded in error, as the temple of this name stood two miles from Rome on the Via Appia, and to the left on leaving the city.

It is a most beautiful construction of brick, elegantly designed, and executed with great skill. The walls of the cella externally are of yellow brick, the basement and pilasters of red, and the moulded parts are carved, and the cornice is enriched with modillions. On the southern side the pilasters are changed for octagonal columns set in a sort of niche. It appears that on this side there was a road, which was the cause of a greater richness and of variation in the design. The portico had originally four peperino columns, of which however only part of one on the ground near the temple remains. The interior was adorned with stuccoed ornaments.

Temple of Vesta.—One of the temples to Vesta, situated in the Forum Boarium near the banks of the Tiber. Nibby thinks that it was constructed in the time of the Antonines. It is of a pure Greek style, and may have been rebuilt by Vespasian, who probably commemorated it by striking a coin, on the reverse of which this temple is represented. Twenty Corinthian columns, of which nineteen remain, surrounded the circular cella, which was formed of masonry in the Greek taste. These columns are of Parian marble, and fluted; they are raised on a series of steps, most of which have been destroyed or removed. The antient entablature and roof are wanting, and the latter is supplied by an ugly tile covering.

Temple of Ceres and Proserpine.—Rebuilt by Tiberius, and now forming part of the church of Santa Maria in Cosmedin, called also the Bocca della Veritá, is situated almost opposite the circular temple of Vesta. A part of the cell constructed with large masses of travertine, and eight columns of the peristyle, remain partly walled up in the church. The fluted white marble columns are in a good style, and of the Composite order.

Temple of Fortuna Virilis.—Originally built by Servius Tullius on the banks of the Tiber. It was burnt and rebuilt in the time of the republic. It is of an oblong figure, constructed of travertine stone and tufa, and stuccoed with a fine and hard marble stucco. The hexastyle portico of the Ionic order has been walled up between the columns, and an engaged intercolumniation is continued on the walls of the cella. The temple is placed on a high moulded basement, and was ascended by a flight of steps. The columns support an entablature, the cornice is bold, and the frieze is decorated with festoons supported by infantine figures, and intermixed with skulls of oxen and candelabra. These are however ill preserved. The style of the architecture is heavy; still the basement is a grand feature.

Temple of Fortune, according to Nibby, but, in the opinion of Bunsen, the temple of the *Vespasiani*, is situated in the Forum Romanum, on the Clivus Capitolinus. On the entablature is the following inscription:—

SENATVS POPVLVSQVE ROMANVS
INCENDIO CONSVMPTVM RESTITVIT.

The edifice now consists of a rude Ionic hexastyle portico of granite columns, two of which are returned on the flank, and so badly restored from the ruins of the former temple, that in one instance part of the shaft from the base is placed under a capital. The bases, capitals, and the entablature are of white marble. The internal part of the frieze is ornamented, but this appears to have been some of the old masonry used in the rebuilding. The portico and temple were placed on a high basement of travertine, which was covered with a veneer of marble, and in front there was a flight of steps

Temple of Jupiter Tonans, according to Nibby; Bunsen calls it the *Temple of Saturn*. It is situated on the Clivus Capitolinus. It was built by Augustus, and is supposed to have been restored by Sept. Severus and Caracalla. On a fragment of an inscription on the entablature over the three columns of the angle, is read . . . . ESTITVER. The portico was hexastyle, of the Corinthian order, and of white Luna marble. The columns are deeply fluted. In order to gain space, the steps are constructed between the columns in the basement which supports them. The basement was lined with marble, and divided at intervals by small pilasters. Upon the frieze are carved instruments of sacrifice, and the decorations which remain indicate that the building was highly ornamented. Between this temple and that called the Temple of Concord, are the ruins of a small ædicula, in which was discovered a votive altar sacred to Faustina the Younger. To the left of this temple are some chambers, in front of which was a portico of cipollino marble columns, of the Corinthian order; the capitals are however adorned with victories and trophies. From an inscription on the entablature of the portico, these chambers appear to have contained the statues of the Dii Consentes, replaced by Vettius Agorius, præfect of Rome, A.D. 368. Nibby considers this building to have been originally constructed by Hadrian. It was burnt in the reign of Commodus, and restored by Septimius Severus. Bunsen calls it 'Porticus Clivi et Schola Xantha.' (See the *Plan of the Forum*, by Bunsen.)

Temple of Concord. The site only of this temple remains near the temple of Jupiter Tonans. Of this famous building there remain only the ruins of the cella, which was originally covered with giallo antico and pavonazzetto. The pavement was formed of slabs of the same material, and numerous fragments discovered in the late excavations prove that it was profusely enriched with ornamental carvings and statues, and that it was also destroyed by fire. Owing to the narrow site on which it was placed, the cella was wider than the portico.

Temple of Antoninus Pius is in the Forum of Antoninus, now the Piazza della Pietra, and at a short distance from the Column of M. Aurelius Antoninus. Eleven large Corinthian columns, which are much injured, remain on the north side, and support a white marble architrave; the rest of the entablature, being much ruined, was restored with stucco. The columns have been walled together, and form the front of the present Custom-house, in the court of which there are several fragments of vaulting adorned with sunk pannels. A representation of the portico with a pediment, belonging probably to this temple, appears on a large bronze coin, from which it appears to have been decastyle. An octastyle portico with a pediment appears on silver and brass coins of the same emperor, and most probably represents another temple belonging to the Antonine Forum.

Temple of Antoninus and Faustina. Erected by the senate to the emperor and his wife in the Forum Romanum. The two sides of the cella of Peperino, once clothed with marble, remain, as well as the magnificent marble entablature over them. The hexastyle portico, with the return columns of the Corinthian order, each of one single piece of Carystian or cipollino marble, still supports a considerable part of the entablature. In the frieze are griffins, candelabra, and other ornaments, in a fine style of art. The ascent to this temple was antiently by a flight of twenty-one steps; and on the entablature of the portico is cut the dedicatory inscription to Antoninus and Faustina. The columns, which were once partly buried, have been cleared of the surrounding earth. On the ruins of the cella has been erected the church of San Lorenzo in Miranda. A representation of this temple, with its steps, statues, and pediment, is given in a coin, published in Bunsen's 'Forum Romanum.'

Temple of Romulus and Remus, called by Bunsen, 'Ædes Penatium.' A circular temple in the Forum Romanum, near the temple of Antoninus and Faustina, erected, according to Nibby, at a period when art was in its decline. It is however probable that the circular building belongs to an earlier period than he would assign to it. In the year 527, this building was used as a vestibule to the church of SS Cosmo and Damiano, erected by Felix IV. Urban VIII. applied the present Etruscan bronze door, found at Perugia, and placed the two antique porphyry columns, with their entablatures, in their present situations. This piece of architecture stood originally a little to the left of the present entrance. Bunsen takes no notice in his plan of

no columns, half buried, and standing near the
atium; one is without a capital, and the other
tal and part of an entablature showing a return,
were decorative columns of an enclosure, like
temple of Minerva in the Forum of Nerva.

of Peace, called also the Basilica of Constantine,
v Maxentius, on the antient site of the Horrea
and after his death dedicated by Constantine.
, which consisted of three naves, has the northern-
in good preservation, and divided into three great
bracing the whole length of the nave. The centre
later period, was altered into the form of a
The vaultings of all three are decorated with
sunk pannels and stuccoed ornaments, and the
niches. The southernmost nave was similar, but
tribune. All except the indications of the piers
peared, as well as the great centre nave, at the
of which was the principal tribune, of which
only a few fragments of the vaulted ceiling on
d. High up in the piers there are still some
of the great marble cornice, which was sup-
eight marble columns, one of which, still stand-
time of Paul V., was removed to the piazza
Maria Maggiore. It is of white marble, of the
order, and fluted, eighteen Roman feet in cir-
e and forty-eight high. Winding brick staircases
he roof; one is still almost entire. The building
et long and 220 feet wide. The principal façade
olosseum, and part of an external arcade remains
ection. The pavement was of giallo antico, pa-
, and cipollino. At a later period this building
ted into a Christian church, at which time an
vas formed towards the Palatine, on the Via

of Venus and Rome. Designed and built by the
ladrian, who personally directed the construction.
from fire, and was restored by Maxentius. Of
building the substructions of the surrounding
and the great niches at the division of the cella,
fragments of granite columns, are all that re-
OMAN ARCHITECTURE.]

of Venus and Cupid, so called, stands in what is
o be the antient Horti Variani, and close to the
Santa Croce in Gerusalemme. All that remains
ge edifice consists of an immense niche and two
lls of brick, belonging perhaps either to a great
silica. Near these ruins is a fragment of the
queduct.

called Minerva Medica. A circular domed temple
ected probably about the time of Diocletian. It is
Nibby to have been a large hall, erected in the
ardens, which he places here. The circumference
iches for statues, seven of which have been found
ruins at different times. It appears to have been
marble and painted with stucco, though only a
bare walls and dome, with the buttresses to se-
inst a lateral thrust, now remain. In 1828, a
n of the dome, which had been propped up with
caffolding, fell down.

of Nerva, situated in the forum of Nerva, was
d by Trajan to the memory of Nerva; it was one
sumptuous edifices in Rome. Only three columns
ster, partly buried in the ground, on the south
remain. The ornaments were in the finest style,
roportions of the order form a correct model
oderns. (See Bunsen's plan for the general

of the Sun, on the terrace of the Colonna
the Quirinal hill. This temple, said to have
ed by Elagabalus, was of gigantic dimensions, of
ses of masonry, and highly enriched, if we may
the two great masses that are left—a part of an
and frieze, and the angle of the pediment. The
probably Corinthian, and the style, though not
bad, shows plainly that art was on the decline.
ments of sculpture dug up in the gardens have
in walls at the back of these two masses. The
minently calculated for a colossal temple, as the
t of the building would have been visible from
f Rome.

of Janus no longer exists, but the site is placed,
appearance of probability, by Bunsen, at the
the four great forums, in the immediate vicinity
of the Mamertine prison, the arch of Septimius Severus, and the Basilica Pauli.

A temple for a long time called the *Temple of Jupiter Stator*, afterwards the *Græcostasis*, and lately by Bunsen, first the *Temple of Castor and Pollux*, and afterwards the *Temple of Minerva Chalcidica*. It is situated in the Forum Romanum, next to the site of a temple of Castor and Pollux. The ruin consists of three marble Corinthian fluted columns on an isolated basement of travertine; the columns support a part of the highly enriched entablature, which is in tolerable preservation. The proportions and execution of this fragment are the very finest, and, since the restoration of true architecture, it has served as the great model of the Corinthian order.

Pantheon. [PANTHEON.]

Gates.

Porta Asinaria stands near the Porta S. Giovanni, which was built in its place by Gregory XIII., and to the left of it on going out of the city. The antient gate is closed, and forms, with the walls, a picturesque brick ruin.

Porta Nomentana led formerly to Nomentum, now Lamentana; it stands near the more modern gate called Porta Pia. It was built by Honorius.

Porta Salaria, built by Honorius in his new walls, and substituted for the Porta Collina of Servius, called Salaria from the road to which it leads. Through this gate Alaric entered Rome, A.D. 409.

Porta Capena stands at an angle of the Cælian hill, below the Villa Mattei, within the antient walls of Servius Tullius, and at a short distance from the Porta Latina. The walls of Honorius make a bend inwards towards this gate.

Porta Latina, now closed, stands between the Porta Capena and the gate of San Sebastian. The present gate was constructed by Honorius, A.D. 402, and repaired under Justinian, A.D. 550.

Porta Appia, or S. Sebastiano, situated on the Appian way, and built by Honorius in his extension of the Roman walls. This gate supplied the place of the antient Porta Capena, which was then closed. The fine semicircular brick towers were constructed either by Belisarius or Narses.

Porta Portese, on the banks of the Tiber, in Transtevere, built by Urban VIII., and substituted for the antient *P. Portuensis.*

Porta Pinciana, situated on the Pincian, and now closed; originally built by Honorius, and rebuilt by Belisarius.

Porta Pia, substituted by Pius IV., for that built by Honorius, and called Nomentana, from leading to the Via Nomentana.

Porta S. Lorenzo, built by Honorius, A.D. 402, called also Tiburtina from its leading to Tivoli; it also opened out on the Via Collatina. This gate is attached to the monument at the junction of the three aqueducts, the Aqua Marcia, Tepula, and Julia, which bears an inscription alluding to the repairs made by Caracalla. The aqueduct called Marcia is commemorated by a coin of the Marcii, which possibly may represent the original monument.

Porta Maggiore, situated at a spot called the 'Spes Vetus.' Here are the antient gates of the Via Labicana and Via Prænestina, formed by the monument of the Claudian aqueduct. The Porta Labicana was disfigured by Honorius, but his barbarous construction has been lately removed, on which occasion the tomb of Eurysaces was discovered in Biviis formed by the Labican and Praenestine roads; and at the same time there were uncovered, towards the open country, the magnificent Praenestine and Labican gateways, as they stood before the additions of Honorius disfigured them. The magnificence of these gateways was owing, in a great measure perhaps, to the circumstance of the Claudian aqueduct passing over them. The three great inscriptions on the attic above the gateways show, first, that Tiberius Claudius, the emperor, brought to Rome, the Claudian waters composed of the Cærulean and Curtian streams, and also the Aniene Nova. The second indicates the restoration by Vespasian; and the third, that by Titus. This magnificent façade consists of two great archways, and three piers, each decorated with two rusticated columns of the Corinthian order, placed on a rustic basement, and supporting an entablature and pediment. Above these is the lofty attic in which are the two water-channels. This attic is surmounted with a cornice. Severe in character, this structure is one of the best preserved, and one of the most imposing architectural masses in Rome. From this gate may be seen the four aqueducts, Julia, Tepula, Marcia, and Aniene Vetus.

Porta S. Giovanni, substituted by Gregory XIII. for the antient Porta Asinaria.

Porta S. Paolo, substituted by Honorius for the antient gates of Servius called *Trigemina, Minucia, Navalis*, and *Lavernalis*. Being built on the Via Ostiensis, it was called also *Ostiensis*. The present gate was rebuilt by Belisarius, who constructed it on a new level, the antient being 26 palms lower. The internal gate is older than the time of Belisarius, and is formed with a double arch.

Porta del Popolo, the chief entrance into Rome, the Flaminian Gate, was built by Honorius on a site a little higher up than the present gate, towards the Pincian hill, on a slight elevation; it was removed between the sixth and eighth centuries to its present situation. The name of Porta del Popolo was given to it in the fifteenth century. Aided by Vignola, Pius IV. decorated the external front, after the design of M. Angelo; notwithstanding these great names, the façade is neither very striking nor in very good taste. The internal decoration of this gateway is by Bernini.

Porta Cavalleggieri and *Angelica*, one on each side of the Vatican, are of modern construction. The former is considered to be of the architecture of San Gallo; the latter was built by Pius IV.

Tombs.

Sepulchre of Eurysaces the Baker.—The exact date of the construction of this monument is doubtful; it was most probably erected betweeen 580 and 803 A.U.C. It is situated at the junction in Biviis of the Via Labicana and the Via Praenestina, close to the monument of the Claudian aqueduct, which formed the majestic entrance into Rome from these two roads.

This singular monument was imbedded in the rude construction of the gate built by Honorius in front of the Claudian monument; and the upper part of the tomb was injured by the new constructions. The plan of this building is an irregular trapezoid, formed by the roads and the contracted site. The elevation is divided into three parts: the lower, or basement, of Alban masonry, is divided from the second by a band, on which is formed the second division. The second division is constructed with the circular stone-mortars (*mortaria*) for kneading the bread, which are placed in a perpendicular position, with flat-face piers at the angles; above these is a continuous band, on each of the four faces of which is repeated the inscription,

EST HOC MONIMENTVM MARCEI VERGILEI EVRYSACIS
PISTORIS REDEMTORIS APPARET.

On this is the third story, in which three rows of mortars are placed horizontally, with their circular mouths towards the spectator, having had originally a ball of stone carved in them to represent the dough. This story is bounded by pilasters at the angles with a capital in the Greek style. The pilasters support a frieze, and there was a cornice with a blocking course all round, and a pulvinus on two sides: above and between the extremities of the pulvinus was a band carved with a representation of circular loaves; from this band sprang a pyramidal roof, terminated with the representation of a wicker-basket used to carry bread in. In the principal front was a marble bas-relief representing Eurysaces and his wife Atistia, and underneath a sarcophagus with the inscription,

FVIT ATISTIA VXOR MIHEI
FEMINA OPITVMA VEIXSIT
QVOIVS CORPORIS RELIQVIAE
QVOD SVPERANT SVNT IN
HOC PANARIO.

Within this scarcophagus was a representation of a panarium, or wicker-basket, in which the ashes were deposited. Such part of the frieze of this singular monument as remains has the daily employment of the baker and the business of the bakehouse sculptured upon it.

Tomb of C. Publicius Bibulus, stood originally without the walls of Servius Tullius, at the angle formed by two streets close to the antient Porta Ratumena.

This ruin, which is small, is of two stories, but the lower is buried by the accumulation of soil. It stands now at the extremity of the Corso and forms part of the external wall of a house in the Via Marforio, and at present appears to consist of the upper story only, decorated with four diminishing pilasters, two of which are imperfect, and part of the architrave and enriched frieze. Two tablets without inscriptions are placed in the wall between the pilasters, and in the centre is an antient opening similar to a doorway with moulded architraves. The material is travertine.

The style of this monument is simple, the masonry massive, and it appears to have been erected prior to the Augustan age.

Tomb of the Claudii, a mass of shapeless rubble, stands in the Via Marforio almost opposite the tomb of Bibulus.

Tomb of St. Constantia, erected, on the Via Nomentana, probably by Constantine the Great, to contain the body of either his sister or his daughter, whose remains were placed in a magnificent sarcophagus of porphyry, now in the museum of the Vatican. This edifice was turned into a church by Alexander IV., when it no doubt underwent many changes from its original appearance. It is not a pure specimen of architecture, and is rather remarkable for its arrangement of double Corinthian columns supporting a dome, and for its mosaics, than for any purity of design.

Pyramid of Caius Cestius, constructed in the reign of Augustus, for the ashes of C. Cestius, and situated near the Porta S. Paolo, on the Viae Laurentina and Ostiensis. It has the following inscription, from which it appears to have been erected in the space of 330 days:

C. CESTIVS, L.F. POP. EPVLO PR. TR. PL.
VII. VIR. EPVLONVM
OPVS ABSOLVTVM EX TESTAMENTO
DIEBVS CCCXXX. ARBITRATV
PONTI P.F. CLA. MELAE. HEREDIS
ET POTHI. L.

This almost solid pyramidal mass of masonry is covered with slabs of white marble, and is erected on a basement of travertine. The walls are 36 Roman palms thick. In the centre is a small vaulted sepulchral chamber, decorated with arabesques, of which some brilliantly coloured portions remain. At the angles are two Doric fluted columns of white marble placed on pedestals, and on one of two bases which have been discovered, was a bronze foot, which, from an inscription on the base, appears to have belonged to a statue of C. Cestius. The present entrance is in the centre of the side, which is between the two columns. The earth, now excavated, had been considerably raised round the base of this building. From a fragment of mosaic found in 1824 near the tomb, it is possible that the area on which it stood was paved in that style.

Tomb of Scipio is situated on a cross-road connecting the Via Appia and the Via Latina. The chambers are irregularly excavated in the tufa rock, and appear to have been turned into a tomb, having been originally formed for the purpose of procuring building materials. The antient entrance consists of a rude arch upon peperino imposts, and appears to have been partly covered with stucco and painted. Over the arch is a stout moulding, upon which there was antiently a second story. Several slabs of marble with inscriptions are attached to the sides of the passages and chambers cut in the tufa. An elegant sarcophagus of peperino with a bust of the same material were found in one of these chambers, and have been placed in the Vatican.

Tomb of Caecilia Metella, constructed on an eminence on the side of the Appian way, a little beyond the Circus of Romulus, and dedicated to the memory of Caecilia Metella, daughter of Quintus Metellus, and wife of Crassus. The inscription, which is on a margined pannel, is—

CAECILIAE
Q. CRETICI, F
METELLE CRASSI.

Round in form, and placed on a square basement, it is constructed with magnificent blocks of travertine. It is surmounted with a beautiful decorated frieze and an elegant cornice, from which most probably rose a dome or a conical-formed roof, now destroyed. In its place there is a battlemented wall, built A.D. 1300, which indicates its change from a sepulchre to a fortress. The interior was lined and probably domed with brick. In the time of Paul III. a sarcophagus was found here, which was placed in the cortile of the Farnese palace in Rome.

In the decorated frieze of this monument, just over the inscription, is a bas-relief representing a trophy and a part of a figure of Victory in the act of writing upon a shield, as if to communicate the deeds of the father and the husband. The Victory on the other side of the bas-relief is wanting h of the figures of Victory had slaves bound underneath

usoleum of Augustus, constructed by Augustus, between via Flaminia and the banks of the Tiber, during his th consulate. When it first became ruined is unknown, t being turned into a fortress, and becoming eventually the perty of the Colonna family, it was destroyed in 1167 in opular tumult, and became a shapeless ruin.

The building was of a circular form, 220 ancient Roman t in diameter, and was probably domed. Round the inner erence were thirteen sepulchral chambers and an chamber in the centre, of which there only remains basement of reticulated work in tufa. In the latter part the last century the remains of this edifice were turned o an amphitheatre for bull-fights and fire-works.

Two obelisks without hieroglyphics, which formerly stood the entrance of the Mausoleum, now adorn the piazza of nta Maria Maggiore and the Quirinal.

usoleum of Hadrian, now called *Castle of S. Angelo*, by Hadrian on the right bank of the Tiber, within the ens of Domitia. This building consists of a circular r whose present diameter is 188 feet, placed on a quadri- basement, each side of which is 253 feet. It was ly decorated, but no vestiges of the decorative part main. Procopius, who described it in the sixth century, re it was injured, says it was built of Parian marble, adorned with statues, both of men and horses, of the e material. (*Goth.*, lib. i.) Between the time of the re- lding of the walls of Rome by Honorius and the Gothic r. it appears to have been already turned into a fortress, without injury to the decorations. During the wars with Goths, the Romans, being shut up in the building, were luced to the necessity of throwing down the statues on ir besiegers. In the tenth century it was fortified by a tain Crescenzio, and afterwards increased in extent and engthened by the popes Nicholas V., Alexander VI., and ban VIII., the last assisted by Bernini. The antient rway, recently opened, is situated immediately in front the bridge; at the same time the antient spiral-way ich led to the sepulchral chambers was discovered. This e with a gentle inclination to the summit of the build- ; part of the white mosaic floor with which the way was red is still remaining.

Columbaria.

Between the temple of Minerva Medica and the Porta ggiore are two columbaria, or tombs. The first, to the mory of Lucius Arruntius, consul under Augustus (A.D. 7), sists of two small chambers, in one of which are some ll cinerary urns; and in the other, some pictures on the and some small figures and ornaments of stucco. ond consists of one chamber.

nbarium in the Villa Doria Pamfili. This colum- the general plan of which was tolerably well pre- in 1829, consisted of several small chambers irregu- osed. It has however been lately destroyed. The red by W. B. Clarke, architect, was published in Library of Entertaining Knowledge—Townley Marbles.'

Columbarium of Cneius Pomponius Hylas and of Pomponia talina stands in the same vineyard which contains the of Scipio. The small urns and tablets in their several ppear to belong to a period from the age of Augustus time of the Antonines. This columbarium is filled niches with their ollae and lapidary inscriptions, and is y decorated with arabesques.

b in the Vigna di Luzzano, at a short distance from Porta Pia, and without the walls. The date is uncertain. square chamber of fine travertine masonry surmounted cornice is in high preservation, and also the three ophagi of the interior, which are highly enriched reliefs, and contain skeletons. The upper part, was probably circular, has entirely disappeared, and rvation of its base was entirely owing to its having uried.

Bridges.

Aelius, now Ponte S. Angelo, crosses the Tiber iately opposite the Mausoleum of Hadrian, now the of S. Angelo. It was constructed by Hadrian as an e to his mausoleum and the gardens of Domitia, ch frequented by him, and in which he also circus. The whole of this bridge is ancient except trifling restorations of masonry, and a side of the Castle of S. Angelo. The bridge consists of three large arches and two small arches, with buttresses attached to the piers and starlings projecting beyond them. It was restored by Nicholas V. in 1450, and the Clements VII. and IX. decorated it with modern statues. Clement IX. added the parapet.

Pons Milvius, now *Ponte Molle*, on the Flaminian way, rather more than a mile from the city. It was antiently called not only Milvius, but Mulvius and Molvius. The construction is attributed to Æmilius Scaurus. about the middle of the seventh century of Rome. According to Livy (xxvii., c. 51), there must have been a bridge here at least a century earlier. A part only of the bridge is antient; Nicholas V. restored it in the middle of the fifteenth century up to which period the extremities consisted of wooden drawbridges.

Pons Sublicius, or Sublician Bridge, first erected by Ancus Marcius, of wood, was destroyed by an inundation in the time of Augustus, and rebuilt of stone by M. Æmilius Lepidus, the censor, an event which is commemorated in a coin of the Æmilii. From this circumstance it took the name of Æmilian. It was restored by Antoninus Pius, and in little more than six centuries after was destroyed by a great inundation of the Tiber during the reign of Pope Adrian I. What remained of it after this was removed, in 1454, to make cannon balls, and nothing but the rubble basements of the piers are visible when the water is low. From the coin it appears to have consisted of three arches, and was adorned with an equestrian statue of the censor.

Pons Fabricius, built by Fabricius, the Curator Viarum, A.U.C. 690; connects the city with the *Isola Tiburtina*, and is the best preserved of the antient Roman bridges.

Pons Gratianus is a continuation of the Pons Fabricius, connecting the Isola Tiburtina with Transtevere. It was constructed about A.D. 367, during the reigns of the emperors Valentinian and Gratian, from whom it derives its name.

Pons Janiculensis, now *Ponte Sisto*, connecting Transtevere with the city above the Fabrician bridge. It appears to have been called Janiculensis under the emperors, and to have been restored by one of them. It was ruined in the middle ages, and reconstructed under Sixtus IV. in 1774 by Baccio Pintelli.

Pons Palatinus or *Senatorius*, now called Ponte Rotto, was below the Fabrician and Gratian bridges, and above the Sublician; only three arches of it remain, on the Transtevere side. It was first built by P. Cornelius Scipio Africanus, and was repaired by Augustus. It was a very handsome bridge, and had a roof supported by marble columns. Being carried off by a great flood, it was rebuilt by Pope Pius III., and again by Gregory XIII. in 1575; after which it broke down, and has not been repaired since.

Pons Triumphalis, called also *Pons Vaticanus*, was constructed in a bend of the river near the Vatican. It is conjectured to have been built by Caligula or Nero as a means of easy access to their gardens on the Vatican. It appears to have been ruined about the fifth century: some remains of the rubble piers of this bridge may be seen when the water is low.

Theatres and Amphitheatres.

Theatre of Pompey, built by and named after Pompey the Great, occupied the space circumscribed by the palace called Pio, the Campo di Fiore, and the streets called Chiavari and Giupponari. Under the palace there are some ruins of this edifice.

Theatre of Marcellus, built by Augustus, and dedicated to Marcellus, son of Octavia, his sister, in honour of whom he named the portico attached to this theatre. This was the second solid theatre constructed in Rome, and consisted of three orders, the upper of which is entirely lost. The remains of this building are in the Piazza Montanara, and a small part near the entrance to the Palazzo Orsini. A small portion of the curved part of the theatre shows the remains of two orders of architecture, the Doric and Ionic, both in a bad state of preservation. The highest order above the Ionic is supplied by the upper story of the modern dwellings, which are formed in the antient curved front of the theatre. The style of the architecture is much superior to that of the Colosseum, and was the Palladian model of the Roman Doric and Ionic orders.

Flavian Amphitheatre, or Colosseum, commenced by Vespasian, in the last year of his life, on the site of the great pond formed by Nero within the extent of his *Domus Aurea*. [AMPHITHEATRE.]

Amphitheatre called Castrensis, a small brick amphitheatre, at what time erected is unknown, but probably, if we may judge from the style of brickwork, in the first century of the Christian æra. It originally stood without the walls of Servius Tullius, but during the reign of Honorius it was employed to form part of the new enclosure, and the arches were filled up. On the inside the form of a semi-ellipse on its greatest axis is all that can be discerned; but externally the engaged Corinthian columns of the lower order, with their brick capitals, are well preserved; of the upper order there only remain a pilaster and part of an arch. During some excavations made here, an Egyptian statue, and some pieces of marble with which the amphitheatre was decorated, were discovered.

Arches.

Arch of Titus stands near the ruins of the temple of Venus and Rome. On the side facing the Colosseum is a finely cut inscription on the attic:

SENATVS . POPVLVSQVE ROMANVS.
DIVO . TITO . DIVI . VESPASIANI . F
VESPASIANO . AVG.

Erected by Domitian, in honour of Titus, and to commemorate the great event of the conquest of Jerusalem. It is of Pentelic marble, and of an elegant design, but with only one arch. On each side were fluted columns of the composite order, of which only two on each side, and these imperfect, are antique; the rest of the arch was restored by Pius VII. On the sides of the piers under the arch, which is highly decorated, are two very fine bas-reliefs, illustrating the victory of Titus over the Jews. In one of them is represented the golden table, the trumpets and horns of silver, and the golden candlestick with its branches. The triumph of Titus is represented also on the frieze on the outside of the arch.

Arch of Septimius Severus, erected A.D. 205, by the senate and Roman people, in honour of Septimius Severus, and his sons Caracalla and Geta, for their victories over the Parthians, the Arabs, the Adiabeni, and other oriental nations. In the long inscription on the attic may be recognised the erasure made by Caracalla when he changed the expression, ET . P . SEPTIMIO . L . F . GÆTÆ . NOB . CÆSARI, for P . P . OPTIMIS . FORTISSIMIS . QVE . PRINCIPIBVS. The arch is of Pentelic marble, with archways and transverse archways through the piers of the centre arch. Each front is decorated with four fluted columns, and a series of bas-reliefs, which, though not of a high order, are highly interesting as a picture of the modes of warfare and the commissariat of a Roman army. From a medal of Severus and Caracalla, it appears that the attic of the arch was decorated with a chariot drawn by six horses, and in the chariot was placed the emperor between his two sons: on each side of the car was a soldier on foot and a soldier on horseback. The whole of the mouldings and the vaulting are highly enriched with carved ornaments. An accumulation of earth had half buried this monument when it was first excavated by Pius VII., and afterwards by Leo XII., Pius VII., and Gregory XIV.

Arch of Constantine, erected in commemoration of his great victory over Maxentius, stands near the Meta Sudans, and fronting the Colosseum. Formed with three archways, adorned with four beautiful columns of giallo antico on each side, and enriched with many fine bas-reliefs and statues, as well as with specimens of art of indifferent workmanship, it shows the decline of art at that period. The fine parts are supposed to have been taken from a triumphal arch erected to Trajan, the situation of which is unknown. It is also possible that some might have been taken from the forum of Trajan. The statues of the Dacian prisoners are probably taken from an arch of Trajan. Above the attic was a triumphal quadriga. The arch remained partially buried until it was excavated by Pius VII., who enclosed the basement within a circular wall. During the reigns of his sucsors the whole of the surrounding earth has been removed, so that the roadway now passes under it.

Arch of Dolabella. This single arch of travertine was constructed A.D. 10, by the consuls Publius Cornelius Dolabella and Caius Junius Silanus. It stands near the church of S. Giovanni and Paolo, and is thought to have been the entrance to the Campus Martialis, where the Equiria, or equestrian games in honour of Mars, were celebrated, when the Campus Martius was inundated by the Tiber. This campus stands immediately to the left after passing the opening. It is flanked on the west by a magnificent substruction of large niches belonging to the Nymphæum of Nero and Temple of Claudius. Nero took advantage of the Dolabella, and passed his aqueduct over it, the which is still extant.

Arch of Gallienus, upon the site of the Esquil dedicated to Gallienus and Salonina, by Marcus A Victor. The gate is formed of a single arch, adorn four pilasters, and flanked with two buttresses, a one of which remains on the side towards the ch Santa Maria Maggiore. The structure is formed blocks of travertine, and is of a plain and simple b bad style of architecture.

Arch of Drusus, erected across the Appian way, the gate of St. Sebastian, by the senate, to Claudiu Drusus, father of the emperor Claudius. It consist arch only, adorned on each side with two marble co the composite order; above the entablature are the of a podiment, and there was also an attic. Caracal the arch as part of the line of his aqueduct for his T An extant coin gives a faithful representation of t when perfect. Excavations have lately been mad this building. The arch appears to have been with marble; but the cornices were formed of sol of that material.

Arch of Janus Quadrifrons, situated in the V the exact date of its erection is unknown, but fr based style and want of simplicity, it may be attri period after Septimius Severus. The form is squa palms on each face, with a large arch in each front, an open vaulted space. In each of the piers support arch are twelve niches in two rows, between w small columns as a decoration forming a double or construction is formed of large blocks of white marbl upper part is ruined, and it was held by the Fran fortress during the civil wars.

Arch of Septimius Severus, commonly called the the Goldsmiths, is situated also in the Velabrum, a to the arch of Janus. This small structure, in which shows the decadence of art, is highly enrich consists of a single opening, square in form, and su on broad pilasters filled with ornament. The follo scription shows it to have been erected by the bank dealers of the Forum Boarium, in honour of Se Severus, Julia Domna, his wife, and Caracalla:—

IMP. CAES. L. SEPTIMIO . SEVERO . PIO . PERTINAC
ARABIC. ADIABENIC. PARTHIC. MAX. FORTISSIMO
CISSIMO.
PONT. MAX. TRIB. POTEST. XII. IMP. XI. COS. III.
PATRIAE . ET.
IMP. CAES. M. AVRELIO . ANTONINO . PIO . FELICI
TRIB. POTEST. VII. COS. III.
FORTISSIMO . FELICISSIMOQUE . PRINCIPI . P. P. PRO
IVLIAE. AVG. MATRI. AVG. N. ET. CASTRORVM .
NATVS . ET . PATRIAE . ET . IMP. CAES.
M. AVRELII . ANTONINI . PII . FELICIS . AVG
PARTHICI. MAXIMI. BRITANNICI. MAXIMI.
ARGENTARII . ET . NEGOTIANTES . BOARII . HVIVS
QVI. INVEHENT . DEVOTI . NVMINI . EORVM.

The name of Geta was originally in the dedicati his name was erased after his death.

Columns.

Column of M. Aurelius Antoninus, in the Piazza C [ANTONINE COLUMN.]

Column of Antoninus Pius was discovered on the Citorio, in the house of the Mission, in 1709. It single piece of red granite, and had a white marble p now in the Vatican, representing alto-reliefs, with scription:

DIVO ANTONINO AVGVSTO PIO
ANTONINVS AVGVSTVS ET
VERVS AVGVSTVS FILII.

The shaft was 68 Roman palms long, and was restore the obelisks erected by Pius VI. This which is represented on the coins of Antoninus Pi enclosed with a fence, and most probably stood wit forum of Antoninus Pius, adjoining that of Aurelius, also the temple called the Temple of Antoninus Pi

Column of Trajan, formed of 34 pieces of white situated in the forum of Trajan, and erected by per r as a decoration to his great forum. The heig sents the height of the Quirinal cut away and r the level site of his forum, and is stated inscription:—

SENATVS . POPVLVSQVE ROMANVS.
P. CAESARI . DIVI . NERVAE . F NERVAE
RAJANO . AVG. GERM. DACICO PONTIF.
IMO. TRIB. POT. XVII. IMP VI. COS. VI. PP.
DECLARANDVM . QVANTAE . ALTITVDINIS.
MONS. ET . LOCVS . TANTIS OPERIBVS
SIT EGESTVS.

imn, admirable both for its proportion and for
and execution of the bas-reliefs and ornaments,
n the best taste, was the receptacle for the ashes
The spiral bas-reliefs do not destroy the line of
y their projection, as in the column of Marcus
alled the Antonine column. The Trajan column
exceptions, in a high state of preservation. A
t. Peter is placed on the pedestal at its summit,
cended by a spiral staircase.

of Phocas, erected in the Forum Romanum by the
aragdus to the emperor Phocas, A.D. 608, according
ption on the pedestal.
ire of the name of Phocas, made by Heraclius, is
on the pedestal of the fluted Corinthian column,
a much earlier date, probably of the time of the
On the top of the capital there was a gilt statue
eror. The pedestal is placed on a flight of steps
onstruction, from which it is evident that the
taken from some other structure.

Forums.

Nerva, situated near the Forum Romanum,
by Domitian, and dedicated to Pallas. It was
rminated by Nerva. It received the names of
m and Pervium, from its being a passage-way to
Two fluted columns of the Corinthian order,
in the ground, with a rich entablature and attic
adorned with a bas-relief of Pallas or Rome,
of the internal decoration of the inclosure of the
inerva. A large part of an irregular line of wall
o this forum is remarkable for its height and
sonry of Travertino, set without cement. It is
ible that the wall is much more antient than the
formation of the forum by Domitian and Nerva.
is wall there is an antient archway with the
diagonally. See the Plan of the Forum, by
the extent and position of this forum.

Trajan, adjoining the forum of Nerva. (See
an.) Of this extensive forum only the Cochlide
part of the Basilica Ulpia can be seen; the rest
buried under the adjacent streets and houses.
ound the pedestal of the column was excavated
ing the pontificate of Sixtus V.; and Pius VII.
1813 caused the present area to be formed by the
the houses and excavation of the site of part of
. The columns are of grey granite, and have
d in their respective situations. The site of the
destals at their entrance may be distinguished,
ous fragments of marble capitals, entablatures,
nts are ranged round the area.

Miscellaneous.

e and Tullian Prisons, situated near the
e to the forum, built prior to the reign of Servius
enlarged by him. Part of the front, forty-five
d eighteen high, is constructed with large blocks
out cement; a part is also buried in the earth.
. F. RVFINVS M. COCCEIVS .... NERVA. COS. EX.
d this edifice in the reign of Tiberius, A.D. 22.
was divided into two floors, and the round hole
ich criminals were dropped into the lower prison

im and Ærarium Sanctius, place for the public
treasure, constructed on the side of the Capitol,
Lutatius Catulus. The inscription referred to
after Poggio is:—

LVTATIVS . Q. F. Q. N. CATVLVS . COS.
STRVCTIONEM . ET . TABVLARIVM . S. S.
FACIENDVM . COERAVIT.

of Rome, by Bunsen.)

m, commonly called the Sette Sale, is near the
us, enlarged by Trajan. It is a large brick ruin,
classed among the Piscinæ, or reservoirs. It is
be older than the time of Titus, though it was
he use of his baths. It consists of two floors, the
ch is buried in the ground; the upper is divided
ers, with the opening from one to the other
e. The construction is very solid.

Cloaca Maxima, said to have been constructed by Tarquinius Priscus. Two parts of this cloaca only are visible, one near the arch of Janus Quadrifrons, and the other on the Tiber near the temple of Vesta. [CLOACA.]

Praetorian Camp, built by Sejanus, in the reign of Tiberius, without the walls of Servius, to the north-east of Rome, and dismantled by Constantine the Great. Three sides of the walled enclosure of a rectangular figure were joined by Honorius to his new walls, and form a large rectangled recess on the plan of Rome. The appearance of the leading features of the camp may be collected from a gold coin of Claudius.

Meta Sudans, a fountain placed at the point of junction of four antient regions, the second, third, sixth, and tenth, and within a short distance of the Colosseum. It appears to have been at least as old as the time of Nero, and was reconstructed by Domitian in the form of a cone, in the centre of a circular basin 80 Roman feet in diameter. This brick rim has been entirely divested of its marble covering and ornaments; the water came out in a jet from the top; a representation of it appears on the coins bearing the impress of the Flavian amphitheatre. In the coin there are two large figures: one may probably represent the colossal statue removed here first by Vespasian and afterwards removed by Hadrian. The gladiators of the amphitheatre are said to have washed themselves at this fountain.

Portico of Octavia, built by Augustus, near the theatre of Marcellus, as a place of refuge for the spectators in the theatre from a storm. The portico, which was burnt, probably in the reign of Titus, was restored by the emperors Septimius Severus and Caracalla.

The ruin consists of one of the principal entrances only, which had two fronts similar in design and proportion; each front was adorned with four fluted Corinthian columns of white marble and two pilasters, supporting an entablature and pediment. Several columns of Cipolino and Carystian marble are walled into the houses of the fish-market, which is its present destination.

The restoration by Septimius Severus may easily be distinguished. A large brick arch and brick piers have been constructed to support the entablature ruined by the fire; some other remains of brick arches clearly indicate, from the difference in construction, the restoration. The style of the original building is bold, simple, and worthy of the Augustan age. A part of the portico is now used as a church.

Palace of the Cæsars, commenced by Augustus Cæsar, on the site of the house of Hortensius, the orator, and of Catiline. Augustus added to the original dwelling of Hortensius a temple dedicated to Apollo, with a portico of Numidian columns, and also a library. This palace, with its posterior additions, was distinguished by the name of 'Domus Augustana.' It was extended by Tiberius, towards the Velabrum, to the extremity of the hill. This part, in contradistinction to the Domus Augustana, was called 'Domus Tiberiana.' It was increased towards the forum by Caligula, and united to the Capitol by a bridge, which was afterwards destroyed by Claudius. The Palatine not being sufficient for Nero, he extended the palace of the Cæsars over the whole of the plain between it, the Cælius, and the Esquiline, and a part even of the Esquiline itself, thus uniting the palace with the gardens of Mæcenas. This extensive palace having been destroyed by the great fire of Rome in the reign of Nero, it was rebuilt by him in a sumptuous style, and called the Domus Aurea. After having suffered many changes and mutilations during the reigns of successive emperors, it was much injured at the sacking of Rome by the Vandals. Yet Heraclius inhabited it in the seventh century, and in the time of Pope Constantine, in the beginning of the eighth century, the greater part of it was standing. Extensive remains of the substructions and some of the corridors still exist, especially towards the Circus Maximus. A rude coloured drawing in the print-room of the British Museum, among the folios of original drawings, represents a portion of a triple-storied colonnade, as it stood in the seventeenth century. The ruins of the palace of the Cæsars stood in what is now called the Orti Farnesiani, and here may be recognised the position of a part of the palace of Augustus, of that of Tiberius, of Caligula, and of Nero. The most extensive parts of the ruins are the foundations and basements which sustained the external porticos, and the basements of the other parts of the palace, which from time to time was enlarged. On the higher part of the hill may be seen considerable re mains of the famous Palatine library, built by Augustus, and the magnificent temple of Apollo connected with it, and built after the victory of Actium. Towards the Circus Maximus are the foundations of the theatre built by Caligula, in the palace which he joined on to the front of the house of Augustus. Near the temple of Apollo, but below it, there are two small chambers, called the baths of Livia, which are very well preserved, and the painting and gilding are in good taste.

Villa of the Quintilii, extensive ruins, at the distance of five miles from Rome, on the Via Latina, hitherto called 'Ruins of the Pagus Lemonius.' This villa was built by the Quintilii, who were destroyed by Commodus. The inscription on the leaden pipes dug up in the villa contains the name of the Quintilii. Among the ruins, which appear to have been enlarged or restored about the close of the third or beginning of the fourth century, may be distinguished an amphitheatre, two magnificent bathing-halls, an aqueduct, and a fountain.

Fountain of Egeria, erroneously so called, is a chamber, situated in a valley about a mile from the Porta Latina, and at a short distance from the Via Latina. It appears from its construction to be a combination of reticulated with lateral work, and to be about the age of Vespasian. It is a chamber which contains eleven niches. The pavement was of serpentine; the lower part of the walls was once adorned with verde antique, and the niches were lined with white marble, with margins of rosso antico. All these embellishments are gone, and there is only a mutilated recumbent statue at the extremity of the chamber. A small spring of water still oozes from this building.

Curia Hostilia, on the southern side of the Forum. Three walls only of this building remain; they were originally covered with marble, and the façade was probably decorated with columns.

Milliarium Aureum, close to the arch of Septimius Severus, in the Forum Romanum. On the left, looking towards the Capitol, is a circular terminal, placed on a circular basement lined with marble.

Circus Maximus, situated in the valley at the south side of the Palatine hill, was founded by Tarquinius Priscus, and restored and enlarged by Julius Cæsar. Augustus erected the obelisk of the spina. It was burnt in the great fire of Rome under Nero. Vespasian restored and perhaps enlarged it. Trajan embellished it, and under Constantine the Great it was again repaired and beautified, and his son Constantius erected the second obelisk. Of this vast edifice the general form only is distinguishable in the vineyard in which it now stands.

Circus of Romulus, commonly called the circus of Caracalla [CIRCUS], is adjoining to the temple of Romulus, and is of the same style of brick construction. This circus was consecrated by Maxentius, A.D. 311, according to the inscription upon it.

TOPOGRAPHY OF ANTIENT ROME.

It is universally admitted that the part of Rome which was said to have been built by Romulus, occupied the Palatine hill on the eastern side of the Tiber. This town on the hill was, according to the custom of the Latins (Göttling, *Geschichte der Röm. Staatsverfassung*, p. 17), built in a square form, whence it is called *Roma Quadrata* (Fest., s. v.; Dionys. Hal., i. 88): it was intersected by two main streets, one running from north to south, the other from east to west. The point at which these streets intersected each other was called *gruma*, or *groma* (from which perhaps the name Roma was formed), and sometimes *mundus*. This spot, which itself formed a square, existed till a very late period, and was surrounded by a wall. This original Roma is generally supposed to have had three gates: 1, Porta Mucionis, or Mugonia, at the northern extremity of the hill, which looked towards the northern part of the Forum Romanum; 2, Porta Romanula, or Romana; and 3, the Porta Janualis. The Pomerium, that is, the precincts within which auguria could be taken, ran, according to Gellius (xiii. 14, 2) round the foot of the hill; but it seems to have been extended even before the union of Rome with any of the neighbouring places, for, according to the description of Tacitus (*Annal.*, xii. 24), the Pomerium embraced not only the sides of the hill, but a considerable portion of the adjoining plain. It ran from the Forum Boarium through the valley of the Circus Maximus, including the Ara Maxima, to the Ara Consi, along the foot of the Palatine as far as the Curiæ Veteres, subsequently the Thermæ Trajani. From thence it proceeded along the top of the Velia to the chapel of the Lares, subsequently the Arch of Titus; it then crossed the valley between the Cælius, the Carinæ, and the Velia. The space from this last-mentioned place to the point from which it commenced, subsequently the Forum Romanum, through which no line is mentioned, was then a lake or swamp. (Niebuhr, *Hist. of Rome*, i. 288.) The town itself, which had about the same extent as the Pomerium, was probably surrounded by a wall and a narrow ditch. Towards the Capitoline and the Aventine respectively it was surrounded by swamps and ponds. Between the Palatine and Cælius the valley was not so deep, and it contained a long tract of elevated ground called the Velia, on which side the town, being easy of access, required fortifications.

As early as the time of Romulus, Etruscan settlements existed on the Cælian hill, and extended over Mons Cispius and Oppius, which are parts of the Esquiline. Whether these Etruscans lived in open villages or fortified places is unknown; but we learn from Varro that they were compelled by the Romans to abandon their seats on the hills, and to descend into the plains between the Cælius and the Esquiline, whence the Vicus Tuscus in that district derived its name. The principal of these Etruscan settlements was, according to the well-known hypothesis of Niebuhr, called Lucerum.

The three hills north of the Palatine, that is, the Quirinal, Viminal, and Capitoline, were occupied by Sabines, and the last of these hills was their citadel. Their town on the Quirinal was, according to Niebuhr, called Quirium. When the Latin and Sabine towns became united, the valleys between the hills must have been drained, and the cloacæ by which this was effected belong to the earliest architectural remains of Rome. (Niebuhr, i. 391, et seq.) The valley between the Palatine and Capitoline was set apart as the place of meeting for the two nations (Comitium and Forum Romanum), and the boundary between the territories of the two towns was probably marked by the Via Sacra, which came down from the top of the Velia, ran between the Quirinal and the Palatine, and then making a bend proceeded between the latter hill and the Capitoline, as far as the temple of Vesta, whence it turned right across the Comitium towards the gate of the Palatine.

The Seven Hills inhabited by these three different nations were united into one town, and surrounded by a wall by king Servius Tullius. The Pomerium had been extended with the increase of the city, but the Aventine, though included in the new wall, did not lie within the Pomerium, and it continued to be chiefly inhabited by plebeians. Hence it is not mentioned among the districts of the city by Varro, who calls them Palatium, Velia, Cermalus, Cælius, Fagutal, Oppius, and Cispius. All these were within the new Pomerium. Cermalus was the spot at the foot of the Palatine, where the Lupercal and the Ficus Ruminalis were, and where in early times, when the waters were high, the ground was flooded from the Velabrum. The Fagutal was, according to Niebuhr, the wide plain between the Palatine and the Cælius-Septizonium and the Colosseum. The new fortification consisted in some places of a wall, probably with towers at certain intervals; in other places the steep sides of the hills rendered artificial fortifications unnecessary, for instance, on the western side of the Capitoline. The north-eastern part from the Colline to the Esquiline gate, seven-eighths of a mile in length, was fortified by a wall, or rather mound. From the border of a moat 100 feet broad and 30 feet deep, was raised a wall 50 feet wide and above 60 high, faced towards the moat with flagstones, and flanked with towers. (Niebuhr, i., p. 394, &c.) Traces of this gigantic work are still visible. From the Colline gate the wall ran in a south-west direction along the skirts of the Quirinal, then turned off to the western side of the Capitoline, and proceeded along this hill through the low grounds between the Palatine and the river towards the northern point of the Aventine. It then ran along the western and southern sides of the Aventine, crossed the valley between this hill and Monte San Balbina, part of which was enclosed towards the southern skirts of Caelius, and after running along them, it proceeded in a northern direction towards the Esquiline gate at the southern extremity of the great mound. The gates of this wall, as far as they can be ascertained, were:—1, Porta Salutaris. 2, Porta Sangualis: both led from the Campus Martius to the Quirinal. On the same side ly probably—3, Porta Fontinalis, from which, in the time the Republic, an arcade led to the altar of Mars in the ampus Martius. 4, Porta Ratumena, probably on the orthern side of the Capitoline, and likewise leading to the ampus Martius. 5, Porta Carmentalis, on the southern side the Capitoline, and near the present Vicolo della Bufala. gate, together with the—6, Porta Triumphalis, and rta Flumentana, lay in the line of the wall which ran ross the low ground from the Capitoline to the Aventine, not, as has generally been supposed, in a straight line m the southern end of the Capitoline to the river, which osition has suggested an entirely false direction of the of Servius in this part. The Porta Flumentana was r to or on the spot of the Janus Quadrifrons, and the orta Triumphalis at the north-western entrance of the ircus Maximus. Near this gate, or perhaps connected ith it, were the so-called—8, Duodecim Portæ, which Pliny rkons as one gate. 9, Porta Trigemina, a little below the livus Sublicius, leading up the Aventine from the Forum oarium. On the steep side of this hill towards the river ere was no gate. The next was the—10, Porta Navalis, hich, in early times, probably led to Ostia. The district fore it was called Regio Navalis; it was the ship-wharf maritime arsenal of the city, and a great number of ines were built in this plain. Between the Porta aus and the Porta Capena, on the Cælius, we have three es—11, Porta Naevia; 12, Porta Raudusculana; and— Porta Lavernalis. The first of these three lay probably the valley between the Aventine and Monte San Balbina; second on the hill of San Balbina, and the third in the between this hill and the Cælius, that is, south of the a Capena. The Porta Raudusculana must have been point at which the road to Ardea commenced. 14, apena was probably at the foot of the Cælian hill. exact course of the wall from this gate towards the and then north towards the Esquiline gate, cannot be ly ascertained, though we know that the Lateran was included. 15, Porta Cælimontana must have been wards the Esquiline. 16, Porta Esquilina was at the outhern end of the great north-eastern wall, near the arch f Gallienus; from it issued the Via Prænestina and Labi- a. 17, Porta Querculana was probably in the valley be- the Cælius and Esquiline. The great wall commenc- at the Esquiline gate, in its whole extent from south to h, had two gates besides the Esquiline, viz. 18, Porta lis, which lay about the middle of the wall; and rta Collina, which must have been on the spot where Via Salaria and Nomentana meet. The sites of the rta Catularia and Piacularis are entirely unknown.

The whole circumference of the walls of Servius Tullius as about six miles. They included considerable tracts of nd which were not occupied by buildings, but were either sture-grounds or covered with wood or thickets, such as parts of the Esquiline and Viminal. Accordingly in of war the people of the surrounding districts took e within the walls of the city, where they found suf- t space and food for their cattle. It was however prin- the inner space near the wall itself which was not upied by buildings until a very late period. Servius Tullius ed the whole city within the walls into four regions, ch coincided with the four city tribes into which he ided the commonalty. The Capitoline, which was the ity of the gods, and the town on the Aventine, were not cluded in these regions. Their names were: 1, *Regio urana*, comprehending the Cælius, the Carinæ, and the between them (afterwards the site of the Colosseum), ia Sacra, and the Subura; 2, *Regio Esquilina*, com- ng the whole of the Esquiliæ, as far as they were in- l within the wall; 3, *Regio Collina*, extending over iminal and Quirinal; and 4, *Regio Palatina*, which prehended the whole of the Palatine.

ach of these regions was again subdivided into six dis- which derived their names from the Sacella Argeo- which probably stood wherever two streets crossed each r, so that these subdivisions appear to have been com- masses of houses, such as were subsequently called Their number is stated by Varro to have been twenty- ; twenty-four belonging to the four regions, and the remaining ones probably to the Capitoline.

y great buildings were erected at Rome during the period. The great temple of Jupiter was on the l. The prison of Tullius, called Carcer Tullianus, or was at the eastern foot of the Capitoline. It is uncertain whether the remains are genuine which are generally considered to belong to this prison. The Circus Maximus was between the Palatine and Aventine, of which there are probably no remains. The Forum Romanum was between the Palatine and Capitoline. The Cloaca Maxima carried the waters of the Velabrum and the Forum Romanum into the Tiber, and was a stupendous work. The wall of the elder Tarquin formed an embankment on the east side of the river: the remains are still visible to some extent. Of the wall of Servius Tullius few traces remain; but it existed in the eighth century of Rome, as appears from the description of Pliny (iii. 5), and from Dionysius of Halicarnassus (ix., p. 624).

During the early part of the Republic, we find no mention of such great architectural works as those which were built during the period of the kings; but, with the increase of the population, many of the uncultivated and uninhabited districts must have gradually become covered with houses. About 120 years after the establishment of the republic, when the city was taken by the Gauls, the whole was consumed by fire, with the exception of the Capitol, a few houses on the Palatine, and some of the works above enumerated, the magnitude of which saved them from destruction. The hasty mode in which the city was rebuilt explains the fact that down to the time of Nero the streets of Rome were narrow, irregular, and crooked, and, in point of beauty and regularity, Rome was far inferior to most of the other great towns in Italy. After this restoration, a long time probably passed before any new ground was built upon. Down to the fifth century of the city, private houses were generally covered with shingles, and there continued to be a number of groves within the walls of the city. But towards the end of the period which is comprised between the Gallic conflagration and the end of the second Punic war, Rome began to be embellished with temples, which however, both as to material and architecture, were far inferior to the temples of Greece. High roads and aqueducts also began to be built. The streets of the city itself were not paved, though we have no reason to suppose that they were neglected. At a somewhat later period we find public places, streets, and walks under the porticos, commonly paved with large square blocks of tuffo or of travertino. In the year 176 B.C., the censors ordered the streets of the city to be paved with blocks of basalt, which were laid on a stratum of gravel, such as is still visible in a part of the Via Appia. At the time of the war with Hannibal, the district near the river, between the Capitoline and Aventine, was almost entirely covered with buildings, and it was called Extra Portam Flumentanam.

The private houses had from the earliest times been very simple in structure; but after the conquest of Greece, and more especially of Asia, individuals began to build their dwellings in a magnificent style, and the taste for splendid mansions and palaces increased so rapidly, that a house like that of Crassus, which at first was universally admired for its splendour and magnificence, in the course of a few years was lost among superior buildings. Public edifices however still remained the chief objects of the pride of the Romans. Theatres, a class of buildings which had once been scarcely tolerated, were erected in several parts of Rome during the last century of the republic, especially after the time of Sulla. During the civil wars between Marius and Sulla we find that the number of houses had increased to such a degree, that the walls of Servius Tullius in several parts lay within the city itself, and Niebuhr thinks it not improbable that at this time a suburb already existed in the plain west of the Tiber, which was afterwards called the Regio Transtiberina. At the beginning of the eighth century of the city, another suburb is mentioned, In Æmilianis, between the Circus Flaminius and the Quirinal. A third arose south of the Cælius, a mile from the Porta Capena, and was called Ad Martis.

Of all the splendid buildings which were raised during the latter part of the republic, scarcely any traces exist, and the only remains which can with any probability be reckoned among them, are the substructions of three antient temples below the church of San Nicola in Carcere; the so-called temple of Fortuna Virilis, not far from the theatre of Marcellus; and perhaps also the three columns of the so-called temple of Castor and Pollux, near the Forum.

Augustus might well say that he had changed Rome from a city of bricks into one of marble, for the roads, aqueducts, and public buildings of every description, temples, arcades, and theatres, which were raised during his long and peaceful reign, were almost innumerable. The whole plain between the Quirinal and the river became a new town, which in splendour and magnificence far surpassed the city of the hills: this new town was one mass of temples, arcades, theatres, and public places of amusement, not interrupted by any private habitations. Aqueducts for the purpose of supplying the city with water had been built as early as the year 313 B.C., and the first (*Aqua Claudia*) was begun by Appius Claudius. It ran almost entirely under ground, and conveyed the water from a distance of about eight miles in the direction of the Porta Capena into the city. Other aqueducts (*Anio vetus*, 273 B.C.; *Aqua Marcia*, 145 B.C.; *Tepula*, 127 B.C.; *Julia*, 35 B.C.) were constructed, but it was not until the Imperial period that this kind of architecture reached perfection, and most of the remains which are still extant belong to the period of the Empire. They were mostly built upon arches, which had an easy inclination, so that the water ran gently from its source towards the city. Augustus built two new aqueducts (*Aqua Alsietina* or *Augusta*, and *Aqua Virgo*), and increased the Marcia. Subsequent emperors added the *Aqua Claudia*, *Anio novus* (both in A.D. 50): *Aqua Trajana*, A.D. 111); *Antoniniana* (A.D. 212); *Alexandrina* (A.D. 230): and *Jovia* (A.D. 300). (Frontinus, *De Aquæductibus Urbis Romæ*: Platner, *Beschreibung der Stadt Rom*, i., p. 195, &c.) The division into four regions, made by Servius Tullius, had remained unaltered; but Augustus, for the convenience of administration, divided the whole city, both within and without the walls of Servius, into fourteen new regions, a division which continued to the eighth century, when it began gradually to give way to the Ecclesiastical division into seven regions. Each of the Augustan regions, according to a survey taken in the reign of Vespasian, contained nineteen, or, according to a later account, twenty-two vici, with as many sacella in places where two streets crossed each other (in compitis). Each vicus seems, on an average, to have contained about 230 dwelling-houses, so that every region contained rather more than 3000. About one twenty-fifth part of this number of houses were *domus*, that is, habitations of the rich (palazzi), with a portico in front and an extensive inner court (atrium). The remaining twenty-four twenty-fifths consisted of *insulæ*, that is, habitations for citizens of the middle and lower classes; they had no portico in front, but mostly an open space which served as a shop or workshop. In the interior they may have had a court, but of smaller extent than the atrium of a domus. The number of these insulæ was about 44,000. All Roman houses were very high. Augustus fixed 70, and Trajan 60 feet as the height, above which none were allowed to be built; and the upper story was generally of wood. It was a law of the Twelve Tables which also occurs in the Roman legislation of later times, that no two houses, whether domus or insulæ, should be built closely together; but that an open space of five feet should be left between them. The fourteen regions of Augustus are:—1, Porta Capena, to the south of the gate of this name. 2, Cœlimontium, which embraced the whole of the Cælian hill. 3, Isis et Serapis, the valley between the Cælius, Palatine, and Esquiline. 4, Via Sacra, or Templum Pacis. 5, Regio Esquilina. 6, Alta Semita. 7, Via Lata. 8, Forum Romanum. 9, Circus Flaminius. 10, Palatium. 11, Circus Maximus. 12, Piscina Publica. 13, Aventinus. 14, Regio Transtiberina.

Tiberius, besides completing many of the buildings of his predecessor, began the Prætorian camp on the north east side of the city, in the Campus Viminalis, and surrounded it with high walls. The wealthy Romans at this time had their palaces principally in the district from the Porta Collina to the Porta Cælimontana; they did however not form streets, but lay in gardens within the fields between the high roads which issued from the city: and hence they are generally called Horti, as Horti Mæcenatis, Pallantiani, Epaphroditi, &c. All that had been done for the embellishment of the city previous to the reign of Nero was eclipsed by the magnificent buildings of this emperor: but the greater part of these works, together with those of former days, perished in the conflagration which took place in his reign. His plan of restoring Rome was gigantic, and proved to be impracticable: he proposed to make Rome a port, and to connect it with the sea by long walls from the Capitol to Ostia. But all that he could do, notwithstanding his profusion, was to restore those parts of the city which had been destroyed. The face of the new city however assumed a totally different aspect. On the ruins of the temples and the imperial palace on the Palatine rose the so-called Golden House of Nero, which occupied a space equal to a large town. The greatest care was taken to make the new streets wide and straight, and that the buildings should not exceed a reasonable height. In order to render possible the execution of the regular plan, the several quarters of the city were measured, and the heaps of ruins were removed and conveyed in ships to Ostia to fill up the marshes in its vicinity. All the new buildings were massive, and constructed of the fire-proof peperino, without the old wooden upper story. The width of the new streets rendered it necessary to extend the city beyond its former limits. Some time afterwards, in the reign of Vespasian, a measurement of the circumference of Rome was taken, according to which it amounted to 13½ Roman miles. The subsequent emperors continued to increase and embellish the city; but under Commodus a great part was again consumed by a fire, which destroyed all the buildings on the Palatine. Septimius Severus exerted himself to restore the parts which had been burnt, and to ornament the city, and some of his buildings are still extant. But the grandeur and magnificence of the thermæ of Caracalla, south of the Porta Capena, surpassed all the works of his predecessors. Almost all the great buildings, or their remains, which still exist at Rome, belong to the period between Nero and Constantine.

The most extensive work of this latter period is the immense wall, with its numerous towers, with which Aurelian surrounded the city. The work, which was completed in the reign of Probus (A.D. 276), does not however enable us to form a correct estimate of the real extent of the city, as the objects of the fortification may have rendered it necessary to enclose parts which were not covered with buildings. The Janiculus, which seems to have been fortified from the earliest times of the republic, was now for the first time included within the city walls, together with the Regio Transtiberina. On the north it embraced the whole of the Campus Martius, together with a considerable part of the Collis Hortulorum, or Mons Pincius; and on the south, the Mons Testaceus and a considerable portion of the Via Appia and Latina. On the eastern side it enclosed the Amphitheatrum Castrense, and then proceeded northward to the Prætorian camp. Most of the gates in this new wall were determined by and named after the great roads which commenced at the gates in the Servian wall. The walls of modern Rome, as well as the gates, differ in many parts from those built by Aurelian. The names of the gates of the Aurelian wall, beginning on the north and proceeding to the east and south, are: Porta Flaminia, Pinciana, Salaria, Nomentana, Tiburtina, Collatina, Prænestina, Labicana, Asinaria, Metronia, Latina, Appia, and Ostiensis. Seven bridges connected the eastern and western sides of the river. The whole circumference of these new fortifications was about 21 miles. In the time of Honorius some parts of this wall were decayed, and others had become useless on account of the great quantity of rubbish which had accumulated near them: but they were restored by this emperor. (Platner, *Beschreibung der Stadt Rom*, i., p. 618.) Though the present walls, as already observed (p. 87), do not much exceed the height of fifteen or twenty feet on the inside, owing to the accumulation of rubbish, they are in many places as much as fifty feet high on the outside.

The Prætorian camp, south of the Porta Nomentana, intersected the Aurelian wall: but Constantine destroyed the western side of the camp, which faced the city, and made the three remaining sides serve as continuations of the Aurelian wall. Some remains of these fortifications are still visible.

After the time of Constantine, when the emperors and the Roman nobles had adopted the Christian religion, the decay and destruction of the antient edifices commenced. The building of numerous churches was the immediate cause of this destruction. Neither the court nor private individuals possessed sufficient wealth to raise buildings equal in form or material to those of their ancestors, and as heathen temples could not always be converted into Christian churches, they were generally pulled down and the materials used for other purposes. Numerous columns were thus moved from their places, and the remaining parts of the edifices were carried away and used by any person who chose to take them. During the fifth century of our æra great calamities were inflicted upon Rome by the ravages of the northern barbarians though it is a mistake to suppose that the buildings of Rome

much injury from the invaders, for they could have
st in destroying anything, and all historians agree
g that it was their principal object to carry away
er, and other costly things. The few buildings
re destroyed at the capture of the city by Alaric
re near the Porta Salaria, where the enemy entered.
re in this part still some remains of the house
t which was destroyed on that occasion. A harder
ll the city in 455, when it was taken by the Vandals,
ven then, and notwithstanding the sack of fourteen
buildings seem to have suffered little; the precious
ere the main object of the cupidity of the barbarians.
c and his immediate successors not only took the
care to preserve what remained, but even exerted
es to restore the public buildings which had suffered
beginning to decay. The population however ra-
reased during the fifth century, and became im-
ed, so that towards the end of the century the su-
ound Rome seem to have no longer existed, with the
of that which had arisen between the northern
y of the Janiculus and the Vatican. Rome was
fined to the walls of Aurelian and their resto-
Honorius, and even within its precincts extensive
were uninhabited. The most remarkable buildings
r days indeed still existed, but after the reign of
s they were entirely neglected, and thus one after
they fell into decay and ruin.

ntient writers who furnish information respecting
graphy of antient Rome are: Varro, Livy, Pliny,
two little works commonly ascribed to Aurelius
nd Rufus, the 'Notitia,' the 'Curiosum Urbis
Strabo, Dionysius, and Dion Cassius. The prin-
dern works on the topography of Rome are: Fla-
ndus, 'Roma Instaurata,' Florentiæ, 1742. The
f this work lived about the middle of the fifteenth
Bartholomæus Marlianus, 'Urbis Romae Topo-
' Rome, 1534, reprinted in 1588, though the author
lished an improved edition in 1544, fol. Onuphrius
s, 'Commentariorum Rei publicae Romanae,' libb.
first book contains, 'Antiquae Urbis Imago,' Venice,
. Guido Pancirollus, 'Urbis Romae Descriptio et
Urbis Regionibus Commentarius,' Venice, 1593, fol.
Fabricius, 'Romanarum Antiquitatum Libri Duo,
marmoribus, saxis, membranis veteribus collecti.'
edition appeared at Basel, without date, in 8vo.; a
ppeared in 1567. It is reprinted with the work of
s and others in the 4th vol. of 'Graevii Thesaurus.'
er Donatus, 'Roma Vetus ac Recens,' Rome, 1638,
his work has often been reprinted. Famiano Nar-
oma Antica, cum Figuris,' Rome, 1666, 4to. This
ich gained very great celebrity, has often been re-
and was translated into Latin by Jac. Tollius (in the
us of Graevius). An improved edition, with nu-
additions, maps, plans, &c., appeared in 1818 at
y Nibby, in 4 vols. 8vo.
Borrhichius, 'De Antiqua Urbis Romae Facie,'
1687. T. P. Bellorius, 'Fragmenta Vestigii ve-
mae ex Lapidibus Farnesianis, nunc primum in
dita, cum notis,' Rome, 1673, fol. A new edition
ork, with notes, and plates of the Capitol, was made
Christoph. Amaduzzi, Rome, 1764, fol. Antoine
tz, 'Les Edifices Antiques de Rome, mesurés et des-
aris, 1682, fol. J. Chr. Adler, 'Ausführliche Be-
ng der Stadt Rom, mit Kupfern,' Altona, 1781, 4to.
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edited by F. A. Visconti, in 1803, and by Stef.
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ed illustrata,' 2nd edition, Rome, 1806, 2 vols. 4to.
Fea, 'Descrizione di Roma,' Rome, 1822, 3 vols.
Nibby, 'Viaggio antiquario ne' Contorni di Roma,' in
with plates, Rome, 1819. Burton's 'Antiquities of
have been translated into German and greatly im-
by F. C. L. Sickler, Weimar, 1823, 8vo. The last
t important work on the topography and antiquities
e is, 'Beschreibung der Stadt Rom,' by Platner,
, Gerhard, and Röstell, 3 vols. 8vo., with numerous
d plans, Stuttgart and Tübingen, 1830. The pre-
this work (p. xiii-lvi.) contains a critical account of
e literature of Roman topography.

HISTORY OF ANTIENT ROME.

confine ourselves in this article to a brief outline of the external history of Rome, and endeavour to trace the gradual development of the Roman constitution, so far as this has not already been done in other articles. Taking moreover for granted that the reader is acquainted with the legends of the early history of Rome, we shall only give the results of the latest investigations on the subject, and refer our readers for further information to the best modern works, of which we subjoin a list. Each of the Roman kings and emperors is treated of in a separate article, and a chronological list of their names is given here.

Period I.:—From the building of the city to the establishment of the Republic, from 753-510 B.C.—Romulus, 753-714; Numa Pompilius, 715-673; Tullus Hostilius, 673-641; Ancus Marcius, 641-616; L. Tarquinius Priscus, 616-578; Servius Tullius, 578-534; Tarquinius Superbus, 534-510.

Rome, or at least that portion of the city which ultimately gave its name to the whole, was a Latin colony from Alba Longa, established on the Palatine hill, on the left bank of the river Tiber. Alba, which for several centuries before and at the time of the foundation of Rome was at the head of the confederacy of Latin cities, was now, like the other Latin towns, governed by an annual dictator, who however was probably under the control of a senate. Alba had previously been governed by kings. The legends of Romulus seem to suggest that in his time Alba was distracted by internal dissensions, which, in all probability, induced a number of the citizens, who were discontented with the form of government, to seek a home elsewhere, and thus led to the foundation of Rome. The time of this event is involved in great obscurity, for all the chronological statements which we possess are founded upon calculations made at a time when most of the authentic documents had perished in the capture of the city by the Gauls, and upon such numerical combinations as seemed best to agree with certain symbolical theories which were familiar to the Romans. But for the sake of expediency we shall follow the Varronian æra, which has been adopted by most modern writers, according to which the foundation of Rome is referred to the year 753 B.C. Tradition had even handed down the day on which Rome was founded, and in commemoration of the event the festival of the Palilia was celebrated on the 21st of April. If, according to our supposition, Rome was founded by a portion of the Alban population who left their home because they were dissatisfied with the dictatorial government, we see why the colony adopted the old kingly rule, which, though abolished in the metropolis, continued to exist in the colony for nearly two centuries and a half. It is another proof that the colony was not founded under ordinary circumstances, but by a secession, that until the time of the third king we do not read of any intermarriages having taken place between the colony and the other Latin towns; and hence the legend of the rape of the Sabine women.

The constitution of the colony on the Palatine was a limited monarchy, for in the reign of Romulus, whom the legends call the first king of Rome, it is said that there existed a senate consisting of one hundred members, which, like that of the Latin towns, had criminal jurisdiction, and the preparation of new measures, which were to be laid before the assembly of the people, who might either accept or reject them. How long this Latin colony stood alone and unconnected with any of the towns on the neighbouring hills, cannot be historically ascertained. There existed on the Cælius and the Esquiline an Etruscan settlement, which was said to have been founded by Cælius Vibenna, who seems to have come with a band of malcontents from Vulsinii, and who is said to have joined his forces to those of Romulus in the war against the Sabines. This seems to show that the Etruscan settlement in these parts was older than that of the Sabines. The Etruscan town, which Niebuhr calls Lucerum, seems to have fallen into a state of dependence upon the town on the Palatine (Roma), as may be inferred from the story that the Etruscans were compelled to leave their fortified places on the hills, and to descend into the plain. (Vicus Tuscus; Varro, *De Ling. Lat.*, iv., p. 14, ed. Bip.) The Etruscan colony seems from time to time to have received new settlers from the mother-country, and the last accession of this kind may have been those Etruscans who, after the war with Porsenna, remained behind and inhabited the Vicus Tuscus.

The Latins on the Palatine had made the Capitoline hill their citadel (Acropolis), but a band of Sabines, led by T. Tatius, who settled on the Quirinal and Viminal (this settlement is called Quirium by Niebuhr), appear to have been hostile to the Latin colony, and to have taken from them the Capitoline. A short time afterwards however the three different cities or tribes appear reconciled to one another, and united into one state, with a new pomerium, which included the three original cities. The Latin and Sabine parts of the new state enjoyed equal rights, and each of them was at first governed by its own king and senate of one hundred members. The gods of these two were the Dii Majorum Gentium. The Etruscans, on the other hand, were in a state of dependence, had no king of their own, and did not obtain equality of rights until the time of Tarquinius Priscus. Their gods were the Dii Minorum Gentium.

Rome was thus, in its origin, a state consisting of three distinct elements, which together formed the Populus Romanus, and each of which exercised a certain influence upon the whole, an influence which is discernible in various ways down to the end of the republic. Each of them also seems in some particular departments to have given the tone to the rest. The Latins appear to have had the superiority in political wisdom, and accordingly their influence in this respect prevailed over the two other tribes, while all those political institutions, the introduction of which is ascribed to the Etruscans, consist of little more than mere ceremonies and formalities. As regards religion, each of the three tribes retained its own peculiar worship and rites, though the influence of the Sabines seems to have prevailed in many points. In all matters relating to the military constitution, the influence of the Etruscans and Sabines appears to have predominated; and the Roman armies, down to the time of Camillus, were drawn up in the Etruscan manner. This original diversity however was, in the course of time, effaced by the overwhelming influence of the Latins, and the various elements of the Roman state appear united into one organised body, the constitution and vital energy of which have attracted the attention of political inquirers in all ages and countries.

After the death of T. Tatius, the king of the Sabines, Romulus governed alone, and it was determined that in future there should only be one king, chosen alternately from the Latins and Sabines. Romulus is said to have now divided each of the three tribes, Ramnes (the Latins), Tities (the Sabines), and Luceres (the Etruscans), into ten curiæ, and each curia into ten decuries, so that each tribe contained 100 decuries, whence they were sometimes also called centuriæ. The decuries were not identical with the gentes, but were a subdivision made for the purpose of representing the curiæ, as each decury in early times had to appoint one senator and one eques. (Gottling, p. 62, &c.; Liv., i. 36; Festus, v. *Centuriata Comitia.*) Tribunes, curiones, and decuriones were at the head of these respective divisions, which they represented in political, religious, and military affairs. Each tribe also consisted of 100 gentes or houses, so that on the whole there were 300 gentes. These gentes did not necessarily indeed consist of families connected by blood, but their relation was such that the members of each gens had one common name, generally ending in *ius* (nomen gentilicium), had the right to inherit the property of a gentilis who died without agnati, and had their common sacred rites (sacra gentilicia) and sacred places (sacella). Each gens contained a number of families. To belong to a gens was a characteristic inseparable from a Roman citizen. Hence every citizen had, besides his personal name, another which was derived from that of his gens, of which Caius Julius Cæsar is an example, Caius being the name of the individual, and Julius that of his gens.

Besides the Roman citizens, or burghers, contained in the tribes, curiæ, and gentes, we find from the earliest times a class of dependents called clients (clientes), who were under the patronage of the burghers. What they originally were is not quite certain, though it seems probable that they partly consisted of poor emigrants who had accompanied the first settlers on these hills, and partly of other poor and oppressed strangers who flocked to Rome as an asylum from various neighbouring places, and settled there under the protection of the established colonies. In subsequent times their number was increased by freedmen, who, on being manumitted, had a relation to their former masters similar to that of the clients. The relation of clients to their patrons is one of the noblest features in the history of the Romans. The clients were indeed citizens, but they could not vote in the comitia curiata, or receive the honores; they either tilled the lands or tended the flocks of their patrons, or followed the various trades which the burghers were not allowed to carry on. Numa Pompilius is said to have divided the clients into two classes, those of the city and those of the country. The former were again subdivided into nine colleges or crafts, while the latter were subdivided into pagi as husbandmen. Servius Tullius gave to some clients the right of voting in the comitia centuriata, and incorporated them into his four city tribes (tribus urbanæ), though they continued in the same relation to their patrons as be
By the legislation of the Decemvirs the clientela was l
abolished, and the clients appear almost on a f
equality with the plebeians, and consequently they [illegible]
the comitia tributa. But practically the clientela continued to exist.

A new element was introduced into the population
Rome by the third king, Tullus Hostilius, which was enlarged by his successor Ancus Marcius. This was the
of plebeians. Under Tullus Hostilius, Alba Longa
destroyed by the Romans, and the greater part of the
bitants were transplanted to Rome, where they settled
the Cælius, as far as this hill was not occupied by
Luceres. In the reign of Ancus Marcius many oth
towns were conquered, and the inhabitants, being
to Rome, had the Aventine and the valley between
the Palatine assigned for their residence. (Göttli
d. Röm. Staatsverf, p. 221, &c.) Some of these ne
were probably incorporated into the existing tribes. I
bulk of them formed the class which is hencefo
Plebes, and which in numbers far exceeded the R
cluded in the tribes, who are from this time disti
the name of patricians (patricii or patres). As the pleb
were not included either in the tribes, curiæ, or gentes
did not enjoy the full rights of citizens (non optimo j
They had also no connubium with the patricians,
a marriage between patricians and plebeians was not a l
Roman marriage, and consequently the children of s
marriage had not the privileges of those children who were
sprung from persons who could contract a legal
marriage, or, to use the legal phrase, had connub
was a consequence of a marriage where there was c
that the children were in the power of their father, and were
Roman citizens. This restriction as to marriage was
quently sanctioned by the laws of the Twelve Tables,
was strictly observed till the year 445 B.C., when it was done away with by the Lex Canuleia. The plebeians dif
from the clients, inasmuch as they had their own sacra, which
were regulated by the pontiffs, their own auspicia, some
their own gentes, the independent possession of landed
perty, and did not require the protection of a patron.
old burghers, in contradistinction to the plebeians, and
their relations to them, formed a real aristocracy, or
of nobiles, a character which they had not possessed
unless we apply that name to the relation in which they stood to their clients. In the armies the plebeians formed a distinct body, and in the infantry they always formed the majority. Hence Tullus Hostilius increased the original number of three centuries of equites, each decury having formerly appointed one eques, to six, so that each century now appointed two equites instead of one. The two orders, patricians and plebeians, stood opposed to each other, without their mutual relations being accurately defined; nor do the plebeians themselves appear to have formed a compact body with a regular internal organization. This was an evil, which Tarquinius Priscus first endeavoured to remedy in some measure by admitting the noblest plebeian families into the old tribes, each of which thus consisted of a majority of the old burghers and a number of noble plebeians (*maiores gentes*, and *minores gentes*: Cic., *De Rep.*, ii. 20). The number of the equestrian centuries was now again doubled, and the six new centuries were formed of the gentes minores, so that out of the 1200 equites, 600 were called *secundi* or *posteriores*, to distinguish them from the 600 old patrician equites. (Göttling, l. c., p. 229.) It was probably owing to the opposition of the patrician gentes that Tarquinius Priscus did not place the plebeians on a footing of equality with the patricians, at least in the main points, and it was reserved to his successor, Servius Tullius, to organise the body of the plebeians and to fix their relations to the patricians. This king divided the plebes into thirty local tribes, four for the city (tribus urbanæ), and twenty-six for the country (tribus rusticæ). For further

ırs respecting his new constitution see the article
ɜ **Tullius.** His successor, Tarquinius Superbus,
king of Rome, not only undid what his predecessor
e for the plebeians, but his oppression was equally
ɔoth orders. This led, in 510 B.C., to the abolition
:ingly power and the establishment of the Republic.
ɔonstitution of Rome during the kingly period was
ive monarchy, with a king, a senate, and an assembly
eople (populus). At the head of it was the king, as
ıgistrate, high-priest, and commander of the army.
lemise of a king, the assembly of the curiæ (comitia
for the election of a successor was held under the
cy of an interrex. The king received the potestas
as the imperium from the populus, and was inau-
by the augurs or the college of pontiffs. All other
were appointed either by the particular bodies or di-
ıf the people, whose affairs they managed, or by the
ıt always from among those in whom the people
res had already shown their confidence. The
thus in reality possessed the supreme power, and
t be true, as stated by Livy (i. 8), that the king had
er of electing senators from the tribes and curiae,
y were always elected from those who were equites,
ıeld one of the great offices to which they had been
d by the populus.

ɜnate of the Ramnes on the Palatine consisted of
ıdred members. This number was increased by a
members when the Sabine tribe became united
Latin; and when at last the Etruscans also ob-
ɿual rights, the senate was increased to the number
hundred, each tribe being represented by one hun-
ɔis number seems to have remained unaltered down
me of the Gracchi. (Dionys., v. 55, 60; Liv., *Epit.*,
The senate was convoked by the king, who also
l the subjects for discussion. The majority of votes,
as either ascertained by counting or by a division
), was decisive (Senatus auctoritas, decretum, or
m). But the decrees of the senate did not become
l they obtained the sanction of the populus (jussum
a populi). [**Senatus.**]

ssembly (comitiatus or comitia curiata) consisted of
hers only. These assemblies met either to decide on
concerning the gentes, or concerning public affairs.
rmer the pontiffs presided. The latter related either to
connected with the constitution, or to religion, or to
affairs. They were assembled by the king or his
nt. In these assemblies the chief magistrates were
and the measures prepared by the senate were laid
ıe populus, who might either accept or reject them.
ɔrmer case the measure became law, lex regia, or
a, according as it had been passed under the pre-
ɔf the king or of the tribunus celerum. The decision
r or peace, after the subject had been proposed by
te, was likewise made by the assembled populus.
ɜ of the Imperium, which the populus in its assembly
the king, he became the supreme judge, but he was
to transfer this power to deputies (quæstores, or the
r of the populus), but there was no appeal from his sen-
n the constitution of Servius Tullius, the plebeians,
ntained in his five classes, were admitted to the na-
semblies of the centuries, which were distinct from
itia of the curiae, which still continued to be held.
s **Tullius.**] The plebeians did not obtain the pri-
meeting as a body independent of and unconnected
ɜ patricians before the year 491 B.C. (comitia tri-

e close of the kingly period we find Rome mistress
r all the tribes of Latium and of a part of the
itory. In the territory of the Volsci, the first
n colonies, Signia and Circeii, were founded,
ıia, founded by Ancus Marcius, is also sometimes
Roman colony. On the Etruscan side of the Tiber,
as in possession of the Janiculus, which was pro-
rtified, as a contest with Etruria was to be expected
ır later. From the first treaty of Rome with Car-
rhich was concluded in the first year of the republic,
ıt conclude that the Romans had already formed
nt mercantile connections with foreign nations.
, iii. 22.)

d *II:—From the establishment of the Republic to the*
rship of Sulla, from 510 *to* 82 B.C.—The abolition
kingly power and the establishment of the re-
not produce any other material change in the constitution of Rome. The plebeians derived scarcely any benefit from it, but the patricians extended their power, inasmuch as they appointed, in the place of a king, two magistrates, originally called Praetors and afterwards Consuls, who were proposed by the senate and appointed in the comitia centuriata. Patricians only were eligible to this and the other great offices of the state. With the exception of the office of high-priest (pontifex maximus), which was transferred to the rex sacrificulus, the consuls possessed all the rights and privileges as well as most of the insignia of the former kings; but their office was only annual, and upon its expiration they might be called to account for their conduct. On the termination of their office, they returned indeed to a private station, but as members of the senate they still retained some influence in the administration of the republic. The number of senators, which had been greatly diminished by the last king, was completed to 300 by admitting some plebeian equites into the senate (Dionys., v. 13; Festus, v., *qui patres, qui conscripti*), and these new plebeian senators were called conscripti or adlecti, and hence the phrase *patres conscripti, i.e. patres et conscripti.* Valerius Publicola, to whom this completion of the senate is ascribed, and who according to some accounts was the successor of Tarquinius Collatinus, gave to the new republic a somewhat more definite and regulated constitution, by a series of laws called Leges Valeriae. [**Publicola.**]

The banishment of the Tarquins involved the Romans in a war with the Etruscans, in which the Romans, and especially the plebeian order, suffered very severely; but the Romans soon recovered their strength. [**Porsena.**] The patricians gained a considerable addition to their power when the Sabine Claudii with their 5000 clients emigrated to Rome, and were received among the patricii, of which body they subsequently formed a distinguished gens. The plebeians, who had never recovered some of the rights conferred upon them by the constitution of Servius Tullius, began to show their discontent; but the patricians, who had gained new strength by the accession of the haughty Claudii, endeavoured to quell the aspiring spirit of the plebeians. Accordingly in 500 B.C., when the plebeians refused to take up arms against the revolted Latin towns, Titus Lartius was made dictator (*prætor maximus*, or *magister populi*) with unlimited power both within and without the city, so that during his rule the Valerian laws, by which the plebeians were in some degree protected, were suspended. The war with the Latins lasted till 496 B.C. and the battle of the Lake Regillus, when the Romans again became masters of Latium. This successful event emboldened the patricians still more, and they no longer feared the plebeians. The latter had by their service in the armies been obliged to neglect the cultivation of their fields, and in the war against Porsena they had lost a considerable portion of their lands. Receiving no compensation for their losses, they had been compelled through want to become the debtors of the patricians, who, when the time of payment came, exacted their money with the most merciless cruelty, and in cases of insolvency made their debtors their prisoners, and, in a certain sense, their slaves (*addicti, nexi;* see Niebuhr, *Hist. of Rome*, i., p. 571, &c.; Göttling, p. 283, &c.). The most conspicuous among the oppressors was the Sabine Appius Claudius, who in 495 B.C. was consul with P. Servilius Priscus. The indignation of the plebeians now rose to such a height, that when a war against the Volscians broke out, they again refused to bear arms. But a promise that their condition should be considered and their wishes satisfied, induced them to follow their patrician general. The Volscian city of Suessa Pometia was taken, but the plebeian debtors on their return from the campaign were again thrown into the dungeons of the rich. This incensed the plebeians to such a degree, that nothing could prevent an insurrection but the iron rule of a dictator, M. Valerius, who, with an army of 40,000 plebeians, defeated the Volscians, Aequians, and Sabines. Being again deceived, the plebeians seceded from Rome, and took up a fortified and threatening position on a neighbouring hill (Mons Sacer). The senate in great alarm granted the demands of the plebeians, the exact nature of which is unknown. Some important advantages however were gained: two, or, according to others, five plebeian tribunes (tribuni plebei) were created to protect their order, and two other plebeian magistrates, called aediles. The most important concession however was that which the plebeians shortly afterwards obtained, the right of summoning before their own comitia (comitia tributa) any one who violated the rights of their order. (Göttling, p. 360.)

The year after the secession of the plebeians to the Mons Sacer (493 B.C.), the consul Spurius Cassius renewed the offensive and defensive alliance with the Latins, by which both nations seem to have been placed on a footing of equality: conquered lands were to be divided, the chief commander of the allied army was to be alternately a Roman and a Latin, and the laws made on the days of meeting were to be binding on both states. Rome however gradually became more assuming and arrogant, until, in 388 B.C., the Latin league was dissolved. But soon after the renewal of the alliance with the Latins (489 B.C.), both nations had hard struggles with the Volscians and Aequians, who probably took possession of some of the Latin towns. [CORIOLANUS.] In 486 B.C. the Romans admitted the Hernicans as a third party to the Latin league, in order to strengthen themselves. In the same year the first attempt was made by Sp. Cassius Viscellinus to assign to the plebeians in full ownership a portion of the public lands [AGRARIAN LAWS]; but the attempt cost him his life.

For a series of years (485-479 B.C.) one of the consuls was always a member of the Fabian house, a circumstance which at last raised a suspicion that the Fabii secretly aimed at subverting the republican institutions. The Fabii emigrated with 4000 clients to Etruria, where a few years afterwards they were all cut to pieces by the Etruscans.

The three allied nations, the Romans, Latins, and Hernicans, now carried on a series of wars against the Etruscans, Volscians, and Aequians, in which the allies, especially the Romans, were often near the verge of destruction. The Etruscans made peace in 474 B.C., while the Volscians and Aequians continued their hostilities, and would in the end have probably destroyed the whole Roman army, if the dictator L. Quinctius Cincinnatus had not delivered the consul L. Minucius and his forces at the moment when they were surrounded by the enemy (458 B.C.). The Aequians however still continued to infest the Roman and Latin territories, until 446 B.C., when they were defeated near Corbio, and remained quiet for a long time.

Until the year 472 B.C. the plebeian magistrates, the tribunes, and the plebeian aediles had been elected by the comitia tributa and confirmed by the curiae; but in the year 471 B.C. the tribune Publilius Volero succeeded in procuring for the plebeians the right to elect their own magistrates without any interference on the part of the patricians, to deliberate and make laws in their own comitia (plebiscita), which indeed were not binding as leges, but still must have had a considerable influence, being the declared will of the commonalty. From this time the Roman republic was divided into two opposite classes or parties. On the one hand there were purely patrician assemblies (comitia curiata), in which all the patrician magistrates and certain classes of priests were appointed, and which were the supreme court of justice for the patrician order; the comitia tributa on the other hand were purely plebeian assemblies, with the right of appointing the plebeian magistrates, of making plebiscita, and of summoning before their tribunal those who infringed the rights of the plebeians. The tribunes and the senate were in a kind of opposition to one another, similar to that of the patricians and plebeians. The comitia centuriata, in which both orders met, were a feeble bond of union. This anomalous condition of the state, and the constant disturbances arising from it, necessarily produced a conviction that a reform in the constitution could not be avoided. The tribune C. Terentillus Arsa therefore, in 462 B.C., proposed that ten men should be appointed to make a code of laws, by which it was chiefly intended to limit the power of the consuls. But this proposal met with the strongest opposition from the patricians, and it was not carried into effect for a number of years, during which the commonalty continually gained strength, especially by the increase of the number of tribunes to ten, 457 B.C., and by the assignment of the Aventine to the plebeians (456 B.C.). At length preparations for a new code of laws were made, and in 451 B.C. ten patricians were appointed for the purpose; all other magistrates were suspended until the business should be completed. The result was that in the first year ten tables were produced, with which both parties were satisfied. In the second year, when the patricians had secured the decemviral power to themselves, two other tables were added. When the task was completed, the decemvirs were unwilling to lay down their power, to which however they were at last compelled by the people. The usual magistrates were now again elected, both orders became reconciled, and in 449 B.C. the laws of Valerius and Horatius declared that plebiscita should be leges and binding on the whole nation (Liv., iii. 55); and that there should be no magistrate from whose sentence an appeal might not be made to the people. Various other measures were at the same time taken to secure the plebeians in the possession of their newly acquired rights. But they still continued to be a separate body, for the whole administration remained in the hands of the patricians, and no connubium yet existed between the two estates. The connubium however was obtained in 445 B.C., by the tribune Canuleius (*rogationes Canuleii*), who also made an attempt to divide the consulship between the two estates. But the latter of these rogations was evaded by the patricians, who agreed that, instead of two consuls, six military tribunes with consular power should be elected indifferently from both orders. (Niebuhr, ii., p. 398, &c.; Göttling, p. 326, &c.) This evasive concession was made because the patricians were determined not to give to the plebeians the censorial power with which the consuls had been invested; and in order to retain this, the patricians created two censors, a new curule dignity, which belonged to their order exclusively, until the year 351 B.C., when the plebeians participated in this dignity also.

After these arrangements, though frequently violated by the patricians, Rome enjoyed a short period of internal tranquillity; but abroad her arms were kept in constant activity by the wars with Fidenae, which was destroyed in 426 B.C., with the Aequians, who were defeated, in 418 B.C., at the foot of Mount Algidus, by the dictator A. Servilius Priscus, and with the Veii. The war with Veii lasted for several years, and in 396 B.C. this wealthy city was taken by M. Furius Camillus. Two years after, the Faliscans surrendered to Rome. This success of the Roman arms was partly owing to the invasion of Etruria by the Gauls, who however, in 390 B.C., completely defeated a Roman army on the small river Allia. The Gauls then advanced towards Rome, took and burned the city, and laid siege to the Capitol. The whole narrative of this event in the antient historians is distorted by fictions. The simple truth is related by Polybius (ii. 18), who says that after the Gauls had taken possession of Rome, they were induced, by an inroad of the Veneti into their own territory, to quit Rome and return home; though the city was indeed soon rebuilt, its weakness encouraged the Aequians, Volscians, and Etruscans to renew their hostilities; but they were conquered by Camillus, and two Roman colonies, Sutrium and Nepete, were founded in Etruria, as a barrier against the enemies. The Hernicans and Latins also endeavoured to shake off the yoke of their alliance with Rome, and renewed the contest for their liberty. The former, after a series of campaigns and reverses, were completely subdued in 306 B.C.; while the Latins, induced by the repeated incursions of the Gauls, soon renewed their alliance with Rome.

The oppression of the patricians, together with the numerous and wearisome campaigns, and the invasion of the Gauls, had reduced the plebeians to a condition which was little better than it was before the first secession. Two noble plebeians, L. Licinius Stolo and L. Sextius, now determined to keep the oligarchical party in bounds, and to procure for their own order a share in the consulship. In 376 B.C. both of them were tribunes, and in this capacity proposed four rogations to the following effect:—1, That no more consular tribunes should be appointed, but two consuls instead, one of whom should always be a plebeian; 2, that no citizen should possess above 500 jugera of the public domain, and should not keep above a certain number of cattle upon them; 3, that the amount of interest paid by debtors to that day, should be deducted from the capital, which was to be paid off in three annual instalments; 4, that instead of the duumvirs who kept the Sibylline books, decemvirs should be elected, five of whom should be plebeians. The ensuing contest was carried on with the greatest determination and bitterness. The patricians contrived to get the veto of the other tribunes, but Licinius and Sextius prevented the elections of the higher magistrates, so that from 375 till 371 B.C. Rome was in a state of complete anarchy. The two tribunes Licinius and Sextius however retained their office from year to year; and in their tenth tribuneship, they first carried their fourth rogation, and soon after the senate felt obliged to agree to the others

itement at Rome had been tremendous, and the me-
of Camillus, who had just returned from a victory
e Gauls, was necessary to allay the fury of party-
Lucius Sextius Lateranus was the first plebeian con-
B.C., and a temple was erected to Concordia as a
ent of the happy reconciliation of the two orders.
sharing the consulate with the plebeians, the patri-
being determined to retain all that they could, cur-
he consular dignity of one important part of its
and reserved to themselves exclusively the jurisdic-
judicial (in the modern sense) authority. Accord-
hey created the offices of praetor and of curule
However, it was a consequence of the advantages
ned by the plebeians, that all the other great civil
igious offices were gradually thrown open to them:
e dictatorship in 356 B.C.; the censorship in 351
e praetorship in 336 B.C.; and at last, in 300 B.C., by
alnian law, the offices of pontiff and augur. The
inction between patricians and plebeians thus gra-
lisappeared in all matters of real importance, and
internally strengthened, united, and consolidated,
now enabled to direct her whole energy against
l enemies. But this internal harmony was at first
pparent than real, for the patricians made many
s to evade the Licinian laws, and they contrived for
er of years to keep the consulship to themselves, or
they kept the plebeians away from it by electing
dictator or an interrex. The law respecting the
of money was likewise not always observed, and the
manner of exacting payment of debts gave rise in
ases to complaint. The beneficial working of the
stitution did not fully manifest itself until after the
B.C.
rst plebeian dictator, C. Marcius Rutilus, carried on
gainst the Faliscans and Tarquinienses (365 B.C.),
as terminated by a peace. Caere obtained a truce
undred years by giving up to Rome half of its ter-
53 B.C.). The last war against the Gauls, who had
als renewed their attacks on the Romans, was suc-
terminated (349 B.C.) by L. Furius Camillus. The
ith Carthage was renewed in 348 B.C., probably on
of the Greek pirates, who about this time infested
ts of Latium, and against whom the Romans were
to protect themselves. (Livy, vii. 27.) The great
hich the Romans had gradually acquired and shown
arious contests with their immediate neighbours,
an to be displayed in the war against the Samnites,
oon brought them into contact with all the nations
This war however was preceded by a victory over
cians and Aurunci, which opened to the Romans the
Campania. The Samnite war lasted from 343
.C., and ended in a treaty with Rome, whose power
n to raise apprehension throughout Italy. [SAM-
The Latins were the first who showed this feeling,
y demanded to be put on an equality with Rome,
of the consuls and half of the senators should be
The consequence was a war with the Latins, and a
ation of that against Samnium, for which the Latins
rceded. The Romans were successful against both,
38 B.C. all Latium was subdued. Some of the towns
the Roman franchise with or without the suffra-
hers lost their fortifications and part of their terri-
he Latin confederacy was dissolved, and the com-
and connubium, which hitherto existed among
the Latin states, was abolished.
stablishment of a Roman colony at Fregellae and its
ion led to a second war with the Samnites, who were
ith Palaeopolis and Neapolis, two Greek colonies,
elying upon this alliance, ventured to insult the Ro-
A Roman army marched into Campania, and Palae-
ll, in 326 B.C., by treason. Neapolis opened its gates
emy. In the year following, the war with the Sam-
mmenced, and lasted till 315 B.C. Appulia submitted
in 318 B.C. The Etruscans, Umbrians, and Gauls
successively against Rome, and the Marsians, Pe-
, Aequians, and Hernicans made common cause with
But as these enemies did not rise at the same time,
they were not all actuated by the same spirit, the
subdued them all, and the Aequians were annihi-
The Samnites in the meanwhile entered into an
with the Etruscans, Umbrians, and Gauls, against
and thus commenced their third war, which lasted
5 to 290 B.C., when they were compelled by M.
Curius Dentatus to make peace. All Latium, Etruria, Campania, Samnium, a great part of Appulia, and several other Italian nations now submitted to the overwhelming power of Rome.

The internal state of the republic during these wars was tolerably quiet, as the plebeians had gradually acquired the same rights as the patricians. Appius Claudius Cæcus distributed, in 312 B.C., the libertini (freedmen), who as aerarii were not included in the tribes or classes, among all the tribes; but this arrangement lasted only till 304 B.C., when Fabius Rullianus threw all the libertini into the four city tribes. The last secession of the plebeians, 286 B.C., arose from a renewal of the attacks on the personal liberty of a debtor; but the law of the dictator Hortensius pacified them by securing to the plebeians their rights, and by giving to the plebiscita the full effect of leges.

In 284 B.C. the Tarentines in southern Italy secretly induced the Etruscans and Boians to revolt; the Samnites also again took up arms, and the Lucanians and Bruttians laid siege to Thurii, where they were defeated by the consul Fabricius Luscinus, who left a Roman garrison at Thurii. The Gauls destroyed one Roman army, but the Boians were defeated in 283 B.C. The Tarentines insulted a Roman fleet which had been driven into their port by a storm, and at the same time took Thurii, drove away the Roman garrison, and plundered the town. But being pressed by a Roman army under Aemilius Barbula, Tarentum sought and obtained the aid of Pyrrhus. [PYRRHUS.] The war with Pyrrhus and the Tarentines lasted from 281 to 275 B.C., and three years afterwards Tarentum surrendered to the Romans, and Rhegium also soon fell into their hands. The war with Tarentum made the Romans masters of the whole of the southern peninsula; and all Italy, from the Sicilian Straits to the river Macra in the north of Etruria, now recognised the supremacy of Rome (265 B.C.). Colonies, chiefly Latin, that is, colonies which had inferior rights to the Roman colonies, were established in various parts to ensure the submission of the conquered nations, and the Italian states and towns either received new constitutions or retained their old ones, modified according to the circumstances under which they had submitted to Rome. Some towns however, such as Capua, seem to have remained almost independent states.

The Roman constitution had now gained its perfection, and out of an exclusive aristocracy a moderate democracy had gradually been developed, in which all classes exercised their proper influence with the power to counterbalance each other. This constitution lasted without any important change for a considerable time, and Polybius, who saw it in operation towards the end of the Punic wars, looked upon it with high admiration. (Polyb., iv. 2.)

Two conquering republics cannot easily exist as peaceful neighbours. After the conquest of Italy, Rome was as desirous to take Sicily, as Carthage was jealous of the gigantic strides which Rome had made. The immediate causes which led to the first Punic war, together with its progress from 264 till 241 B.C., are described in the article PUNIC WARS. The result of this war was that Rome gained possession of Sicily and the adjacent islands; and Sicily became the first Roman province. [PROVINCIA.] Syracuse however, Panormus, Segesta, and some other Sicilian towns retained their independence. The immense loss of men which Rome had sustained was scarcely felt, and the way for new conquests was prepared. In 238 B.C. the Romans took possession of Sardinia, where the rebellious Carthaginian mercenaries sought the protection of Rome against the natives. Notwithstanding the hard struggles of the Sardinians as well as the Corsicans for their independence, the Romans in the end made themselves masters of both islands, and the Carthaginians, who, after the conclusion of a war against the mercenaries in their own country, attempted to reduce their armies in Sardinia and Corsica to obedience, were compelled to evacuate the islands and to pay to Rome 1200 talents. In the meantime a war broke out with the Ligurians (238 B.C.), who were probably instigated by the injured Carthaginians. The Insubrians also formed extensive connections with other Gallic tribes, and when, in 232 B.C., C. Flaminius carried a plebiscitum to the effect that the country of the Senones, between Sena Gallica and the Rubicon, should be assigned to the plebeians, the Boians, who had most to fear, united with many of the neighbouring tribes, and even with some of the Transalpine Gauls, and marched southward as far as Clusium, where they were completely defeated by the consuls L. Aemilius and C. Atilius (225 B.C.). The Romans now advanced towards the north, gained a second victory over the Gauls at Clastidium, and took possession of Mediolanum (222 B.C.). The Gauls in Gallia Cisalpina, despairing of success, submitted to Rome, which strengthened its power in these parts by two new colonies, Cremona and Placentia. A year after this event Istria was added to the Roman republic. While the Gallic war was carried on, Illyrian pirates gave rise to the first war with Illyricum, which lasted from 230 till 228 B.C. The Illyrian queen Teuta was compelled to give a part of her dominions to Rome, to pay tribute, and to stop the piracy of her subjects: some Greek towns, which had been subject to her, were declared free. The Romans thus came in contact with Greece. (Polyb. ap. Zonaras, viii. 9.) A second war with the Illyrians, in 219 B.C., made the Romans masters of the whole coast of Illyricum.

While Rome was thus engaged, the second Punic war was caused by the operations of the Carthaginians in Spain. It lasted from 218 till 202 B.C. [PUNIC WARS.] Great as the sufferings were to which Italy was exposed during the presence of the Carthaginian armies, and although the majority of the Italians had sided with the enemy, still the Romans soon recovered their losses, and established their power more firmly by new colonies in Italy. Spain was added to their former possessions, and when the navy of Carthage was destroyed, Rome was mistress of the sea. But the republic had gone beyond its natural limits, and with their extensive conquests the Romans lost the simple and manly character for which their forefathers had been distinguished: demoralization and corruption began to manifest themselves in their public as well as in their private life.

Philip III., king of Macedonia, after the battle of Cannae, had concluded a treaty with Hannibal. The Romans, into whose hands the treaty fell, sent a fleet to Illyricum, which compelled the king to a shameful flight. This was the prelude to the first Macedonian war, which lasted from 214 till 205 B.C., and was carried on with little vigour. A peace was at last concluded, which was not honestly meant by either party. Accordingly, five years later, when Athens implored the assistance of Rome against Philip and the Acarnanians, a second war with Macedonia commenced, which lasted from 200 till 197 B.C., and was terminated by the battle of Cynoscephalae, gained by Quinctius Flamininus, by which the power of Macedonia was broken. Philip was confined to his own kingdom, and became a vassal of Rome. Flamininus proclaimed the liberty of Greece, but nevertheless he remained several years in Peloponnesus to watch the movements of Antiochus the Great and the Aetolians, to arrange the affairs of Greece, and to foster dissension among the Greeks. There were many occasions on which the Romans might have attacked Antiochus, but their wars in Spain and the north of Italy caused the outbreak of the war to be deferred until 192 B.C. Antiochus, invited by the Aetolians, landed in Greece. The Aetolians obtained a truce for themselves, but the war against Antiochus, who fled to Asia, was continued; the battle of Magnesia decided the victory, and the power of Syria was broken. Eumenes of Pergamus and the Rhodians were richly rewarded for their servility towards Rome, and acted the same part towards Antiochus as Massinissa acted towards Carthage. The Aetolians afterwards concluded a peace with Rome, but on very hard conditions. The Galatians in Asia, and Ariarathes, both allies of Antiochus, sued for peace and obtained it. Asia was now reduced to such a state that it only required one more blow to effect its complete submission.

But the Romans had to contend in northern Italy, from 209 till 191 B.C., and in Spain from 197 B.C., with more determined enemies. In Spain, peace was not restored until 179 B.C., when Tib. Sempronius Gracchus, the father of the celebrated tribunes, by his humanity conciliated the Celtiberians. The Istrians, Sardinians, and Corsicans likewise made a fruitless attempt to shake off the Roman yoke. The corruption of the Romans, after they had become acquainted with the luxuries of Greece and Asia, had rapidly increased. As one instance out of many, we many mention the manner in which the Bacchanalia were celebrated at Rome. (Livy, xxxix. 8-17.)

Perseus, the successor of Philip III. in Macedonia, who had inherited his father's hatred of the Romans, declared war against them in 171 B.C. This war was at first very unfortunate for the Romans, but in 168 B.C. L. Aemilius Paulus decided the fate of Macedonia in the battle of Pydna. Gentius, king of the Illyrians, had been the ally of Perseus, and this circumstance led to the third Illyric war, which ended in a division of the country, like that of Macedonia. In Epirus, Aemilius Paulus and his soldiers behaved with a cruelty which has perhaps never been equalled in the history of the Roman republic. (Liv., xlv. 34.) Eumenes and the Rhodians, who had drawn upon themselves the suspicions of the Romans in the war against Perseus, were now humbled. Others, such as the servile Prusias of Bithynia, Massinissa in Numidia, Seleucus Philopator of Syria, and the kings of Egypt acknowledged the supremacy of Rome, which by cunning and fraud gradually acquired the means of completely reducing them whenever inclination prompted.

The first blow was directed against Carthage, which had long endured the insults of Massinissa, the ally of the Romans; and when at last she attempted to maintain her rights, the Romans razed Carthage to the ground (146 B.C.), and her territory became a Roman province under the name of Africa. [PUNIC WARS.] In Macedonia two pretenders had risen against Rome, the consequence of which was that Macedonia was reduced to the form of a province. The same was the fate of Greece after the fall of Corinth (146 B.C.).

Some years before these events (153 B.C.) a new war had broken out in Spain, as the inhabitants of Segeda did not strictly observe the conditions on which peace had b granted to them. The war was carried on for many years with varying success, and the cruelty of the Romans only contributed to make the exasperation of the Spaniards more general. Viriathus [VIRIATHUS], who had placed himself at their head, carried on the war from 148 till 140 B.C. After his death, Brutus penetrated indeed as far as the western coast, and in 132 B.C. returned to Rome in triumph; but the natives nevertheless did not submit. Numantia offered the most determined resistance, and totally destroyed, 133 B.C. After these bloody wars, was apparently quiet, and Roman commissioners ar the affairs of the country.

During this period Italy appears to have enjoyed perfect tranquillity, and its wealth and population increased (Val. Max., iv. 1, 11), but a formidable insurrection broke out in Sicily. In this island the extensive estates of wealthy Romans were cultivated by numerous slaves, who, being ill-treated by their masters, rose under Eunus and Cleon, and spread destruction all over the island. In 131 B.C., they defeated by P. Rupilius at Enna. Attalus, the last Pergamus, left, in 133 B.C., his kingdom as an inheritance to Rome; the disputes arising out of this gift led to the reduction of Asia into the form of a province (129 B.C.). Phrygia was given to Mithridates V. as a reward for his assistance to the Romans.

How completely the old distinction between patri and plebeians had now disappeared, may be inferred from the fact, that in 172 B.C. both consuls, and in 131 B.C. both censors, were plebeians. Ever since the wars of Hannibal, the number of plebeian senators had exceeded that of the patricians. The only distinction which now had any value was that between *nobiles* or *illustres*, and *obscuri*. The laws which were made during this period had little or no relation to the constitution, but were for the most part intended to counteract the growing love of luxuries (*leges sumtuariæ*), to fix the age at which persons might attain the different offices of the state (*leges annales*), to prevent the extortion of the governors of provinces (*de pecuniis repetundis*), &c. After the reduction of Macedonia (168 B.C.), the treasury (aerarium) of the Roman republic was so well stocked, that the head-tax (tributum) which the Roman citizens had hitherto paid, was abolished. But during this apparent indifference in regard to constitutional matters, a state of things had gradually been developed, which broke out like a volcano, and gave the first example of civil war. An active and thriving middle class did not exist at Rome. The citizens were either exorbitantly rich or in absolute poverty. The illustrious families had almost monopolised the lucrative offices of the republic, and the small landowners, on account of the constant wars, had been compelled to neglect their fields, and in numerous cases had sold them to the nobles. Such reduced persons wandered about homeless, with their wives and children, and lived in extreme poverty. (Plut., *Tib. Gracchus*, c. 9.) The only remedy was to provide this multitude of destitute citizens with lands, and to raise them to the station of an independent

class. This was undertaken by the two brothers,
is and Caius Gracchus. Who they were, what mea-
hey proposed, and how they ended, is related in the
GRACCHUS and AGRARIAN LAWS. The aristocratic
gained the victory in this contest, but it was gained
ie and bloodshed. Several regulations of the agrarian
re abolished, the nobles left off paying the rent which
e for the public domain that they occupied, extended
ore) their possessions by purchasing the smaller por-
f the poor, and expelled the impoverished peasantry
ir paternal roof. (Appian., *Civil.*, i. 27.)

itful example of the demoralised condition of all
Roman citizens was exhibited in the war against
urper Jugurtha [JUGURTHA; METELLUS, Q. CÆCI-
MARIUS, C.; SULLA], who, in 106 B.C., was brought
ie in triumph. During this war there appeared on
thern frontiers of Italy hosts of barbarians, Cimbri
eutones (113 B.C.). Several Roman armies which
ent against them were defeated; but C. Marius, in
., annihilated the whole body of the Teutones near
Sextiæ, and in the following year the Cimbri in the
Raudii. The few barbarians who survived were
slaves or fled into Gaul, where Cæsar saw the rem-
f them. (*Bell. Gall.*, ii. 29.)

aly several petty rebellions of the slaves in Campania
what might be expected, and Sicily became the
f a second insurrection of the slaves, who carried on
il and destructive war with Rome (103-99 B.C.). The
sul M. Aquilius succeeded in subduing the insur-
after their last leader Athenion had fallen. In 96
kingdom of Cyrenaica was given to the Romans by
l of the last king.

Rome, where peace had only been restored by violence,
attempt was made to introduce an Agrarian law,
mover, L. Apuleius Saturninus, a man of no prin-
who acted merely from selfish motives, was put to
with his associates (99 B.C.). (See Cic. *pro Rubir.*, c. 9.)

about this time that two other important subjects
to attract general attention: first, the Judicia, which
a the hands of the equites, and grossly abused. In
the tribune Livius Drusus endeavoured to remedy
l by adding 300 equites to the senate of 300, and by
to this new senate of 600 all judicial powers in matters
ig a person's caput or civil condition. This attempt
er had not the desired effect. The second question
hether the Roman franchise should be given to the
subjects and allies of Rome. Many sensible Ro-
saw the necessity of such a measure; but the powerful
it Rome could not prevail on themselves to come to
finite conclusion. The Italians however persisted in
lemand, which, in 91 B.C., led to the bloody and
ctive Social or Marsian war. The Italians, seeing
iere was no hope of gaining their object, intended
g less than to destroy Rome, to establish a new Italian
ic, with a senate of 500 members and two consuls,
make Corfinium, under the name of Italica, its centre
pital. The Latins and Umbrians remained faithful
ie, and obtained, together with some other places in
the Roman franchise by a Lex Julia. (Göttling,
&c.) In the first campaign the Romans were un-
sful, but Cn. Pompeius Strabo defeated the Italian
it Asculum, which he took and destroyed (89 B.C.).
lians gradually submitted, and received the franchise,
us the great mass of the inhabitants of the peninsula
e Roman citizens. The dangerous designs of Marius
illa induced the senate to promise the franchise to all
who were still in arms, on condition that they should
down. But the Samnites resolutely continued the
nd in the ensuing civil contest they joined the party
ri. The new citizens were, according to some
vided into 15 new tribes; according to others, into
according to Velleius Paterculus, they were distri-
8 of the old tribes. This last account is the most
But Italy had lost the flower of her population,
y once flourishing towns had been destroyed and
the ground. The number of tribes which, at the
f the war with Porsena, had been considerably re-
was afterwards gradually increased to 35, a number
emained till the latest times. The province of Gallia
ina received in the same year, by the Lex Pompeia,
, that is, those political rights which the Latins
d previous to receiving the full franchise, and
expressed by the term commercium. In the dictatorship of Julius Cæsar the Transpadani were placed on an equality with the rest of Italy, and obtained the Roman franchise. The circumstance of Rome giving the franchise to all the Italians without altering its constitution accordingly, was a great mistake, and the first step towards the dissolution of the republic.

For the war against Mithridates, which now followed, and the civil war between Marius and Sulla, see the articles MITHRIDATES, SULLA, and MARIUS. The first Mithridatic war lasted from 87 till 84 B.C. After its conclusion, Sulla returned to Italy, forced his way to Rome, and after having been made perpetual dictator (82 B.C.), he endeavoured to restore peace and save the republic by a new but ill-judged constitution [SULLA], according to which the aristocracy were to form the basis of the republic, just as the Gracchi had endeavoured to base it on an independent middle class.

Period III:—From the Constitution of Sulla to Augustus, from 81 *till* 30 B.C.—In the year 83 B.C. the second Mithridatic war broke out, in which the Romans were defeated, and, in 81 B.C., they concluded a peace with him. After the death of Sulla, in 78 B.C., M. Æmilius Lepidus attempted to repeal all the leges of Sulla, but he was defeated in a battle by Lutatius Catulus, and fled to Sardinia, where he died. The tribunes also exerted their utmost power to recover the position which they had lost by the constitution of Sulla. After many fruitless attempts, their object was attained in 70 B.C., in the consulship of Pompey and Crassus, when, by the Lex Aurelia, the senate was deprived of the exclusive possession of the Judicia, which Sulla had given to it. The judicial power was now divided among the senate, the equites, and the tribuni aerarii. Thus the constitution of Sulla was abolished after it had been in force for about ten years.

The history of Rome from this time forward is little more than the history of the leading men. See the articles POMPEY, CÆSAR, CICERO, SERTORIUS, ANTONY, &c. In 74 B.C. Mithridates commenced the third war against the Romans, which led to the complete subjugation of all Asia Minor, Syria, and Phœnicia. Other Roman generals in the mean time advanced into Mœsia as far as the Danube, and on the northern coast of the Euxine as far as the river Don and the Palus Maeotis or Sea of Azof. In 63 B.C. Rome was saved by the watchful care of Cicero from the destruction with which the conspiracy of Catiline threatened it. [CICERO; CATILINE.] The suppression of this conspiracy could not prevent the republic from hastening towards its ruin. Between the years 58 and 50 B.C., Cæsar completed the conquest of Gaul; and in 56 B.C., by the treaty of Lucca, the Roman world was divided among Cæsar, Crassus, and Pompey (first triumvirate); and when Pompey, as sole consul, B.C. 52, placed himself at the head of the republic, the civil war between him and Cæsar broke out, which was decided, in 48 B.C., by the battle of Pharsalus. Cæsar, who had now become dictator, defeated the remains of the Pompeian party, and then endeavoured to restore order in Italy; but he was assassinated in 44 B.C. His opponents, whose republican spirit had survived the republic, were unable to restore it; and in the following year a second triumvirate was formed by Octavian, Antony, and Lepidus, whose object was the total destruction of the republican party. This object they pursued by proscriptions and a series of despotic and cruel measures, until they began to quarrel with one another. Their quarrels led to a new civil war, which ended in the battle of Actium, and placed Octavian (Augustus) at the head of the Roman world. Thus ended the Roman republic.

From the time when the constitution of Sulla was abolished, no thorough reform of the republic was attempted. All that we read of are isolated measures, some of which were calculated to promote the democratical interests, such as the laws of Clodius, by which the power of the magistrates was limited; while others, more in an aristocratical spirit, were intended to introduce gradual improvement, and to preserve as much of the old forms as possible. The numerous innovations of Cæsar, in all departments of administration, are the most important changes that were wrought during this period. Most of them were useful, but they paved the way to the monarchical government, to which the republic submitted the more readily, as for many years it had been accustomed to the almost absolute rule of individuals, who, being only concerned about their own aggrandizement, had brought indescribable sufferings upon the nation. One man at the head of the state, without a rival, was the only remedy for the public evils. A longer continuation of that state of affairs which had existed for the last 50 years, would probably have broken up the Roman empire, and made Italy a scene of bloodshed and misery.

The Roman republic, at the time of its dissolution, comprehended the following countries, which were for the most part administered as Roman provinces:—Italy and all the islands by which it was surrounded: all Gaul as far as the Rhine, nearly all Spain, Illyricum, Pannonia, Dalmatia, Greece with all the islands of the Ægean, Thrace, Mœsia (the Danube here formed the boundary); in Asia all the countries between the Caspian Sea, the Parthian empire, the Persian and Arabian gulfs, the Mediterranean and the Caucasus, that is, Colchis, Iberia, Armenia, Syria, Palestine, Phœnicia, nearly the whole of Asia Minor, the whole of the northern coast of Africa, Mauritania, Numidia, the territory of Carthage, Cyrenaica, and Egypt. In some of these countries however the power of Rome was not firmly established until the Imperial period.

Period IV.:—The Empire to its Downfall, from 30 B.C. *till* 476 A.D.—The spirit of antient Rome and its moral greatness were gone, and freedom, which can only be based on virtue, had perished. The wise therefore, as well as the many who loved peace as the means of securing sensual enjoyments, and who were unconcerned about the consequences to future generations, preferred the mild rule of one man to the late turbulent and convulsed condition of the republic.

As the history of all the Roman emperors is given in separate articles, we shall only make a few general observations on the administration of the empire, and subjoin a chronological list of the Roman emperors down to the time of Justinian.

Augustus gradually concentrated in his own person all the great offices of the republic, though the officers themselves, mere shadows of former days, still continued to be appointed. He thus in effect acquired the sovereign power, being free from all responsibility. He had the right to raise armies, to impose taxes, to decide on peace and war; he had the command of all the legions, and the power of life and death over all Roman citizens, both within and without the city. The senate, after the removal of those whom Augustus had reason to fear, was filled up with individuals who were his mere creatures. Tiberius indeed restored to the senate part of its former power, but the more the influence of the soldiers increased, the more that of the senate declined, which body, as a compensation for this loss, was made a high court of justice, which took cognizance of offences committed by senators, crimes against the state or the person of the emperor, and of the maladministration of provincial magistrates. The relation between the emperors and the senate was very indefinite, and it varied according to the more or less despotic disposition of the head of the state. No provision was made for a regular succession; the first five emperors all belonged to the Julian and Claudian families. (Tacit., *Hist.*, i. 17.) The succession depended upon the will of the actual imperator, who appointed his successor, either by adoption, or by giving him one of the titles, Cæsar, and Princeps Juventutis; or by making him his colleague in the quality of tribune or proconsul In cases where no person was designated, the senate exercised the right of election. But this privilege was soon assumed by the soldiers, who proclaimed the emperors, and the sanction of the senate became a mere form. The numerous body-guards of the emperors (prætorians), who, in their stronghold (prætorian camp) formed as it were a new Capitol, in effect possessed the sovereign power; and on some occasions they sold the empire to the best bidder. The numerous legions in the provinces however soon became acquainted with this secret of despotism, and availed themselves of it.

The election of magistrates was restored to the people by Augustus, but in most cases he recommended or even elected the candidates. Tiberius invested the senate with the power of election, still reserving a preference to those candidates who were recommended by himself, and the comitia merely received information of the election when it had taken place. In the third century however we find that the emperor alone exercised the right of election. The aerarium was at first nominally under the control of the senate. Augustus formed a separate aerarium for military purposes. The fiscus was the name for the property of the emperor as such, which must be distinguished both from the aerarium and the private property of the empe
gradually the emperors took the whole administ
the finances to themselves, and the term fiscus
came equivalent to aerarium in the republican per
order to keep the magistrates both of the city and
vinces in better subordination, they were paid by s

With respect to legislation, we find that in the
Augustus various leges were passed (Lex Julia et P
paea, De Adulteriis, &c.), but after his death we scar
of any leges, and senatus consulta were now made
proposition or the recommendation of the emper
Edicta of the prætors gradually lost their importa
their place was supplied by the Constitutiones p
The emperor himself of course possessed supreme
tion, and for the decision of extraordinary matters,
of appeal, he appointed an especial council, which
have been distinct from his privy council for the
tration of the empire. (Spart. Hadr., 18.)

The Judicia Publica were usually held by the s
civil causes were, as before, tried by judices whom
tor appointed. The administration of the city e
great deal of the attention of Augustus and his s
as the monarchy depended much more on the p
order of the capital than the republic. Respe
division and administration of the provinces, see
PROVINCIA. In the reign of Caracalla all subje
empire were made Roman citizens by a constitutio
emperor.

In this state the government of the Roman e
mained, with a few and not very important alterat
to the time of Diocletian. The measures of this
and Constantine produced a complete change in t
government. [DIOCLETIAN; CONSTANTINE.] The
of the prætorian soldiers ceased, and to it succe
government of the court, with its ministers and inn
officers. The maintenance of these functionaries
numerous armies rendered heavy taxes necessary
misery, wretchedness, and degradation of the natio
to the empire, which had been increasing during
two centuries previous to its overthrow, at last
pitch which it is almost impossible to describe.

The Roman empire, notwithstanding its vast
the end of the republic, still continued to increase.
licia, Rhætia, Noricum, Pannonia, and Mœsia w
pletely subdued and made parts of the empire. Th
was made the boundary in these parts, to secure t
against the incursions of the barbarians. The su
of Spain was completed by the submission of th
Cantabrians. In Germany conquests were also u
more with a view to secure Gaul than to acquire
possessions in that country, and the Rhine ma
sidered as the frontier on that side of the empire.
reign of Trajan the empire attained its greate
Dacia, Assyria, Mesopotamia, Armenia, and Ar
made Roman provinces; but some of these conqu
soon given up, and the Danube and the Euphrate
the boundaries of the empire. Britain and the
part of Scotland had been made a province in th
Nero. But the internal weakness, resulting from
perfect union of so many countries and nations, r
impossible to repel the incursions of the barb
whom the empire was harassed from about the el
fourth century. During this period one country
after another, and Italy itself was invaded by
under Attila (452 A.D.). In the year 476 A.D. Odo
of the Scyrri and Heruli, at the head of a numbe
manic tribes, invaded Italy, dethroned the last em
mulus Augustulus, and was saluted by his arm
Rome. The Roman senate implored his protec
Zeno, the emperor of the East, raised him to the
Roman patricius. Thus ended the Roman emp
West.

Long before this event the necessity of div
unwieldy mass of the empire had been felt, a
the time of Diocletian, had frequently been mad
purpose of facilitating the administration. Const
had become the capital of the Eastern part of the en
it was not until after the death of the elder T
(395 A.D.) that the division into the Eastern and
empires became permanent: the two parts howe
intended to form one whole. The line of d
between the two empires was the Danube, from
above Pesth, down to where it receives the D

ll river Drinus (Drino), and a line drawn past town of Scutari towards the great Syrtis, near the ast of Cyrenaica. All the countries east of this line longed to the Eastern empire, and those west of it to Western empire. The capitals, Rome and Constanple, had each its senate, with equal privileges; but the of union between the two empires was weakened by ourse of events, and they soon began to feel jealous of other. The emperors of the East contrived to avert invasions of the barbarians, and to turn their attention to West, which, being also more exposed to such invasions, destined to fall first; the Eastern empire, which had advantage of a more favourable position for its capital, also greater means and better armies, prolonged its ence for many centuries. And even after it had lost its provinces, and was confined to a very narrow space, it ertheless maintained itself in this wretched condition il the year 1453 A.D., when Constantinople was taken by Turks under Mohammed II.

A Chronological List of the Roman Emperors.

Augustus	from	30 B.C. to	14 A.D.
Tiberius		14 A.D. to	37 A.D.
Caligula		38	41
Tib. Claudius		41	54
Nero		54	68
Galba, Otho, Vitellius		68	70
Vespasian		70	79
Titus		79	81
Domitian		81	96
Nerva		96	98
Trajan		98	117
Hadrian		117	138
Antoninus Pius		138	161
Marcus Antoninus		161	180
Commodus		180	192
Pertinax		193	
Julianus		193	
L. Septimus Severus		193	211
Caracalla		211	217
Opil. Macrinus			
Elagabalus		218	222
Alexander Severus		222	235
C. Julius Maximinus		235	238
Gordianus		238	243
Philippus		243	249
C. Messius Decius		249	251
Trebonianus Gallus		251	253
P. Licinius Valerianus and Gallienus		253	260
Gallienus (Macrianus, Valens, Calpurnius Piso, Aureolus) and Odenathus		261	268
M. Aurelius Claudius		268	270
L. Domitius Aurelianus		270	275
M. Claudius Tacitus		275	276
M. Annius Florianus		276	
M. Aurelius Probus		276	282
Carus (Carinus and Numerianus)		282	284
Diocletian and Maximianus		284	305
Constantius (Galerius)		305	306
Constantine (Galerius, Severus, Licinius, or Maximinus, Maxentius, Maximianus, Constantinus, Constantius, Constans, Dalmatius, Annibalianus from 335)		306	337
Constantius (Constantinus, Constans, Magnentius)		337	361
Julianus		361	363
Flav. Jovianus		363	364
Flav. Valentinianus, Valens (Procopius), Gratianus, and Valentinianus the Younger		364	378
Theodosius (Gratianus till 383, Valentinianus the Younger till 392, Magnus Clemens Maximus, Arcadius from 383)		378	395

Western Empire.

	A.D.		A.D.
Honorius	395	to	423
Joannes	424		425
Valentinianus	425		455
Maximus	455		
Avitus	455		456
Majorianus	457		461
Libius Severus	461		465
Procopius Anthemius	467		472
Glycerius	473		474
Nepos	474		475
Romulus Augustulus	475		476

Eastern Empire.

	A.D.		A.D.
Arcadius	395	to	408
Theodosius II.	408		450
Pulcheria and Marcianus	450		457
Leo I.	457		47
Leo the Younger	474		
Zeno	474		49
Anastasius I.	491		51
Justinus I.	518		527
Justinian I.	527		565

The following is a list of the most important works on Roman History:—

The antient authorities on which the history of Rome is chiefly based are the works of Livy (with Freinsheim's 'Supplements'), Dionysius of Halicarnassus, Polybius, Diodorus Siculus, Appian, Dion Cassius, Varro, Cicero, Sallust, Cæsar, Velleius, Tacitus, Plutarch, Suetonius, Florus, Eutropius, Aurelius Victor, Corn. Nepos, Orosius, 'Scriptores Hist. Augustæ,' Ammianus Marcellinus, Procopius, Zonaras, Xiphilinus, Laurentius Lydus, and many other antient authors, who, though not professing to write the history of Rome, yet incidentally furnish much valuable information.

Among the modern works on the history and constitution of Rome, we may first mention the valuable monographs of Sigonius (contained in Graevii 'Thesaurus Antiquitatum Romanarum,' Ludg. Bat., 1694, &c., 12 vols. fol.), namely, 'De Antiquo Jure Civium Romanorum;' 'De Antiquo Jure Italiæ;' 'De Jure Antiquo Provinciarum:' of Perizonius, 'Animadversiones Historicæ'; Wolfg. Laz., 'Reip. Rom. in exteris Provinciis bello Constitutæ Comment. Libri XII.,' Basel, 1551, and Frankfort 1598; Cuspinianus, 'De Consulibus Romanorum Commentarii,' Basel, 1553, 'Genealogicum Rom. de Familiis Præcipuis Regum, Principum, Cæsarum Rom.,' Frankfort, 1589; and others. Pighius, 'Annales Romanorum, rec. auxit et illustr. A. Schotus,' Antwerp, 1615, 3 vols. fol.; P. Relandus, 'Fasti Consulares,' Traject. Bat., 1715; Ch. Rollin, 'Histoire Romaine, depuis la Fondation de Rome jusqu' à la Bataille d'Actium,' Paris, 1738, 16 vols. 12mo., or 8 vols. 4to. This work has often been reprinted, and has been continued and completed, in Rollin's spirit, by J. B. L. Crevier, 'Histoire des Empereurs Romains, depuis Auguste jusqu' à Constantin,' 12 vols., Paris, 1749. This work of Crevier has likewise often been reprinted. L. de Beaufort, 'La République Romaine, ou Plan Général de l'Ancien Gouvernement de Rome,' La Haye, 1766, 2 vols. 4to.; by the same author, 'Sur l'Incertitude des Cinq Prémiers Siècles de l'Histoire Romaine,' Utrecht, 1738, reprinted at La Haye, 1750, 2 vols. 8vo.; Montesquieu, 'Considérations sur les Causes da la Grandeur des Romains et de leur Décadence,' Paris, 1734, often reprinted; Adam Ferguson, 'The History of the Progress and Termination of the Roman Republic,' London, 1783, 3 vols.; Hook, 'History of Rome,' London; P. Ch. Levesque, 'Histoire Critique de la République Romaine,' Paris, 1807, 3 vols. 8vo.; 'Die Geschichte der Römer zur Erklärung ihrer classischen Schriftsteller,' 2 vols., Leipzig, 1787-90; G. A. Ruperti, 'Grundriss der Geschichte, Erd- und Alterthumskunde, Literatur und Kunst der Römer,' Göttingen, 1794; a second edition appeared in 1811; Chr. F. Schulze, 'Kampf der Demokratie und Aristokratie in Rom,' &c., Altenburg und Erfurt, 1802; Micali, 'Italia avanti il Dominio de' Romani,' Firenze, 1810, 4 vols. 8vo., with an atlas; B. G. Niebuhr, 'Römische Geschichte,' 2 vols., Berlin, 1811. The first volume of the second edition, which was much altered, appeared at Berlin, 1827; and a third edition of the same volume in 1828; the second edition of the second volume appeared in 1831; the third volume was edited, after Niebuhr's death, by Dr. Classen, Berlin, 1832. The whole work only brings the history down to the end of the first Punic war. The first two volumes have been translated into English by J. C. Hare and C. Thirlwall. The whole work has been translated into French by P. A. de Golbery, Paris, 1829-1840. Compare the reviews of the first edition of Niebuhr's work by A. W. von Schlegel, in the 'Heidelberger Jahrbücher. 1817, and by W. Wachsmuth, in his 'Die ältere Geschichte des Römischen Staates,' Halle, 1819; Fr. Buchholz, 'Phi losophische Untersuchungen über die Römer,' 3 vols., Berlin, 1819: K. L. Blum, 'Einleitung in Roms alte Geschichte,' Berlin, 1828. Eisendecher, 'Ueber die Entstehung, Entwickelung, und Ausbildung des Bürgerrechts im alten Rom,' Hamburg, 1829; K. D. Hüllmann, 'Römische Grundverfassung,' Bonn, 1832: and by the same author, 'Ursprünge der Römischen Verfassung, durch Vergleichungen erläutert,' Bonn, 1835; W. Drumann, 'Geschichte Roms in seinem Uebergange von der Republikanischen zur Monarchischen Verfassung,' &c., 4 vols. 8vo., Königsberg, 1834-38: H. Malden, 'History of Rome,' vol. i., London, 1830; H. C. Reiff, 'Geschichte der Röm. Bürgerkriege,' &c., Berlin, 1825, 4 vols. 8vo; Dr. Th. Arnold, 'History of Rome,' 2 vols., London, 1838-1840; J. Rubino, 'Untersuchungen über Römische Verfassung und Geschichte,' vol. i., Cassel, 1839; Dr. Fr. Fiedler, 'Geschichte des Römischen Staates und Volkes,' Leipzig, 1839; C. Göttling, 'Geschichte der Römischen Staatsverfassung,' Halle, 1840.

The history of the Empire has been written by Tillemont, 'Histoire des Empereurs et des autres Princes qui ont regné dans les Six Premiers Siècles de l'Eglise,' Paris, 1700, 4 vols. 4to., reprinted at Brussels, in 1707, 5 vols. 8vo.; Crevier's continuation of Rollin, mentioned above; 'Les Femmes de Douze Césars, avec des Notes Hist. et Crit.,' par M. de Servies, Amsterdam, 1722, 2 vols. 8vo.; Gibbon, 'The History of the Decline and Fall of the Roman Empire,' London, 1776-82, 4 vols. 4to.; this masterly work has often been reprinted. D. G. H. Hübler, 'Geschichte der Römer unter den Imperatoren, wie auch der Gleichzeitigen Völker,' 3 vols., Freiberg, 1803.

The 'Thesauri' of Graevius and Sallengre contain many good works on Roman antiquities; but, besides these, we may mention, Joh. Rosini, 'Romanarum Antiquitatum Corpus absolutissimum, cum Notis Dempsteri,' Traject. ad Rhen., 1701; Samuel Pitiscus, 'Lexicon Antiquitatum Romanarum,' 2 vols. fol., Leovardiae, 1713; Dr. A. Adams, 'Roman Antiquities,' London, 1791, often reprinted; Friedr. Creuzer, 'Abriss der Römischen Antiquitäten,' Leipzig und Darmstadt, 1824.

The private life and manners of the Romans are described in C. Meiners, 'Geschichte des Verfalls der Sitten und der Staatsverfassung der Römer,' Leipzig, 1782; J. H. L. Meierotto, 'Ueber Sitten und Lebensart der Römer in verschiedenen Zeiten der Republik,' second edition, Berlin, 1802, 2 vols. 8vo.; W. A. Becker, 'Gallus, oder Römische Scenen aus der Zeit des Augustus,' Leipzig, 1838, 2 vols. 8vo.; Otto von Mirbach, 'Römische Briefe aus den letzten Zeiten der Republik,' 2 vols., Mitau, 1835; M. Roulez, 'Observations sur divers points obscurs de l'Histoire de la Civilisation de Ancienne Rome,' Bruxelles, 1836.

Works on the Roman finances: P. Burmann, 'Vectigalia populi Romani,' Lugd. Bat., 1734, 4to.; D. H. Hegewisch, 'Versuch über die Römischen Finanzen,' Altona, 1804, 8vo.; R. Bosse, 'Grundzüge des Finanzwesens im Römischen Staat,' Braunschweig, 1803, 2 vols. 8vo.

Works on military affairs: Guischard, 'Mémoires Militaires des Grecs et des Romains,' La Haye, 1758, 2 vols. 4to., and Rast, 'Römische Kriegsalterthümer.'

As chronological tables of the history of Rome: C. J. Zumpt, 'Annales veterum Regnorum et Populorum, inprimis Romanorum,' Berolini, 1819, 4to.; a second edition appeared in 1838. Zander, 'Tabellen der Römischen Geschichte,' second edition, Göttingen, 1829, 4to.; F. Fiedler, 'Zeittafeln der Römisch. Gesch.,' &c., Wesel, 1827, 4to.; Fischer, 'Griechische und Römische Zeittafeln,' Altona, 1810, 4to.; Clinton's 'Fasti Hellenici.'

The works on particular points of the Roman constitution or particular events in Roman history, are too numerous to be mentioned here.

Roman Language and Literature.

It is intended in the following paragraphs to present merely an outline of the history of the language and literature of antient Rome, as a separate notice is given in this work to every writer of importance.

The language of the Romans is usually called Latin; for though Rome and Latium were originally distinct communities, their language appears to have been always the same. Any inquiry into the origin of the Latin language must involve an inquiry into the languages spoken by the antient inhabitants of Italy; and our information on this subject, notwithstanding the investigations of Micali, Grotefend, K. O. Müller, and other distinguished scholars, is at present very imperfect. So much however appears certain, that the Latin language was different from the Etruscan and Oscan, of which the former was spoken by the inhabitants of the northern and the latter by those of the central and southern parts of Italy. The Latins appear to have originally formed part of that great race which overspread both Greece and Italy under the name of Pelasgians. Their language formed a branch of that extensive family of languages which are known to modern scholars by the name of Indo-Germanic; and it is probable that the Pelasgians who settled in Italy originally spoke the same language as the Pelasgians who settled in Greece. There is consequently a great resemblance between the Latin and Greek languages; though each possesses an element which the other does not. Not only does the Latin language possess many words which it has not in common with the Greek, but also in some parts of its grammatical inflection, as for instance in that of the passive voice it differs considerably from the Greek language. It therefore becomes a question, what that element is, which the Latin language has not in common with the Greek; and here we must attain some further knowledge of the languages of antient Italy before we can answer this question satisfactorily. The Etruscan, so far as our imperfect knowledge of it will enable us to form an opinion on the subject, appears to have exercised little influence upon the formation of the Latin language; but the Oscan or Opican language, on the contrary, seems to have united with the Pelasgian in forming the Latin language. Niebuhr (*Hist. of Rome*, vol i., p. 82) has remarked that the words which relate to agriculture and domestic life agree in Greek and Latin, as domus, ager, aratrum, vinum, oleum, lac, bos, sus, ovis, &c.; while those relating to arms and war, as duellum, ensis, hasta, sagitta, &c, are different from the Greek. But this remark is to be taken with considerable limitations, for there are many exceptions both ways; indeed so many as to render the position itself at least doubtful, and all inferences derived from it consequently inconclusive. The words relating to arms and war may have been Oscan: it has therefore been supposed by Dr. Arnold (*Hist. of Rome*, vol. i., p. 22) not only that the Latins were a mixed people, partly Pelasgian and partly Oscan, but also that they arose out of a conquest of the Pelasgians by the Oscans; so that the latter were the ruling class of the united nation, and the former its subjects.

We have very few specimens of the Latin language previous to the time of Ennius and Plautus, when it had become nearly developed and was substantially the same as in the later times of the republic. The specimens of the antient language which have come down to us principally consist of fragments of antient laws preserved by Festus, Cicero, and other writers, and of a few inscriptions. The former, as might have been expected, appear to have been considerably altered; and the latter are unfortunately few to give us much assistance in tracing the rise and progress of the language. Of these however one of the most important was the antient song of the Fratres Arvales which was discovered in the year 1777, and which appears to have been the same as was sung in the most early times, though the inscription was not cut till A.D. 218. We subjoin a copy of it with a few remarks on some of the antient forms which it contains:—

1. E nos, Lases, juvate.
2. Neve luerve, Marmar, sins incurrere in pleoris:
3. Satur furere, Mars, limen sali, sta berber:
4. Semunis alternei advocapit conctos.
5. E nos, Marmor, juvato:
6. Triumpe, triumpe, triumpe, triumpe, triumpe.

1. *Lases* is instead of *Lares*. All Latin words which are now written with *r*, had an *s* originally. Thus Quintilian says (*Inst. Orat.*, i. 4, § 13) that *Valerius*, *Furius*, *arbor*, *labor*, *vapor*, *clamor*, and *lares* were originally written *Valesius*, *Fusius*, *arbos*, *vapos*, *clamos*, and *lases*. According to Pomponius the letter *r* was invented by Appius Claudius. (*Dig.*, i., tit. 2, s. 2, § 36.)

2. *Luerve* is instead of *luervem* or *luerem*, which is equivalent to *luem*. The omission of *m* at the end of words is common in Latin. Thus all the adverbs ending in *o* seem to have lost an *m*, as *quo*, *eo*, &c. [See the article M.] M is also omitted in the same way in the accusative singular of most nouns of the third declension in Greek, and does not appear, if we may judge from the elision in poetry of all syllables ending in *m* before words beginning with a vowel, to have been usually pronounced in Latin. *Luervem*

em instead of *luem* corresponds to the antient forms
erem, *boverem*, *suerem*, instead of *nucem*, *bovem*,
ınd also to the common accusative *cinerem* from

nar is a name of Mars, who was called *Mamers* in
can language. *Sins* is instead of *sinas*. *Pleoris* is
er form of *piures*. The root of this word is *ple*, as
in *ple-mus* and *im-ple-o;* and the comparative is
by adding *ior* or *or*. *Pleores* afterwards became
in the same way as *reversus* or *reorsus* was shortened
rsus.
ıtur furere is to be understood in the same sense as
ıgo satiate ludo of Horace (*Carm.*, i. 2, 37), and
uli in the sense of *pede pulsa limen*. *Sta* appears
signify *cease*. *Berber* is an old form of *fervere*, *b*
nterchangeable with *f*, in the same way as *βρέμειν*
mere, *rubeo* and *rufus*, &c.
munis is instead of *Semones*. The Oscan language
quently *a* where *o* is found in common Latin, as *pust*
Veitune for *Vettona*, &c. *Advocapit* instead of
te, the *e* being omitted as in *dic*, *duc*, *fuc*, *fer*.
ure is here used in the sense of an imperative. *P*
quently used in the old language where *b* occurs
ater forms, as *poplicus*, *Poplicola*, *scapres* (*scabies*),
e Oscan *pruhipid*, *pruhipust*, which are connected
ohibere.
of the earliest specimens of Latinity which have
own to us are the inscription on the Columna Ros-
rected in the Forum to commemorate the victory of
ius over the Carthaginians, B.C. 260 (Plin., *Hist. Nat.*,
11), and the *Senatus-Consultum de Bacchanalibus*,
was passed B.C. 186. (See Orelli, *Corpus Inscrip.*,
; Drakenborch's Livy, vol. vii., p. 97, &c.) In both
, many of the grammatical forms differ widely from
hich were afterwards in use, and approximate closely
pecimens of the Oscan which are still extant. Thus
ablative cases in these inscriptions end in *ed* or *d*, as
t-ed, *dictator-ed*, *navale-d*, *præda-d*, *in alto-d*
senatu-d, &c., which correspond to the Oscan
dolu-d, *malu-d*, *cum preivatu-d*, *touta-d*, *præsenti-d*,
similar resemblance is seen in the third person sin-
f the imperative mood: where, instead of *esto*, we
old Latin *estod*, and in Oscan *estud*. The Latinity of
atus-Consultum de Bacchanalibus differs in so many
s from that of Plautus, who lived at the time at
his measure was passed, as to make it probable that
of the ancient forms in Plautus must have been
in subsequent times.
history of Latin literature may be divided into three
: the first extending from the time of Livius An-
s, B.C. 240, to the death of Augustus, A.D. 14; the
from the death of Augustus to the death of Marcus
s, A.D. 180; and the third from the death of Marcus
s to the time of Cassiodorus, A.D. 539.
Period.—From the time of Livius Andronicus, B.C.
the death of Augustus, A.D. 14.—The Romans may
to have possessed no literature for upwards of 500
rom the foundation of the city; and when they at
began to pay some attention to it, they did little
han translate or imitate the works of the Greeks.
gedies and comedies of Livius Andronicus, who was
writer of whom we have any account, appear to have
ken entirely from the Greek; and the same was the
th Cn. Nævius, who was contemporary with Livius
cus. The first prose writers were Quintus Fabius
and Lucius Cincius Alimentus, who lived in the
the second Punic war, and wrote the history of
rom its foundation to their own times, in imitation
pontifical annals. Cincius however appears to have
his history in Greek; but both his history and that
us, as well as those of the succeeding annalists, ap-
e the pontifical annals which they imitated, to have
ry meagre, containing only memorials of the times,
of places and events, without any ornament; and
d that their meaning was intelligible, they thought,
ero (*De Orat.*, ii. 12), that the only excellence of
s brevity.
us however, who was born B.C. 239, may be regarded
founder of Latin literature. Though a Greek by
e was the first who taught the Romans to write
wn language with ease and elegance, and he was
instrumental in introducing among the Romans a
literature. He lived on intimate terms with some of the most eminent members of the Roman aristocracy, who began at length to study the Greek language. Cato himself learnt Greek from Ennius; and Scipio Africanus, his son Scipio Nasica, and M. Fulvius Nobilior delighted in his society. At the same time, the later comedy of the Athenians was most successfully imitated by Plautus, whose comedies must have had some influence in improving the taste of the people and even of the aristocracy, though the latter do not appear to have shown him any patronage.

In the year B.C. 155, the study of the Greek philosophy was introduced among the Romans, by the embassy which the Athenians sent to Rome, consisting of three of the most eminent philosophers of the age, namely, Carneades of the Academy, Diogenes the Stoic, and Critolaus the Peripatetic; and though the study was condemned by Cato and many of the old school, it soon made great progress among the Roman nobles. The study of the Greek language and literature was still further promoted by the conquest of Achæa, and by the influence of the distinguished Achæan prisoners, who were distributed among the towns of Italy. Among these was Polybius, who attracted the attention of Paullus Æmilius, and was appointed by him instructor of his two sons, Fabius and Scipio. Though Polybius did not write in Latin, he produced a great influence upon Roman literature. He showed the Romans how the history of their own state ought to be treated; and by his intimacy with Scipio and the most distinguished Romans of the time, he produced a great impression upon the literary character of the age. From this time it became the fashion for all well educated Romans to read, speak, and even write the Greek language; and Greek rhetoricians and philosophers found abundant employment in Rome. Literature however was chiefly prosecuted by the great and noble; the body of the people appear to have remained uneducated.

From the preceding account it will be seen that Roman literature only arose and spread in connection with the study of the Greek literature; and the consequence was not only that the Roman writers made the Greeks their models, but that they rarely attempted any original work. One exception however must be made in favour of the Roman satire, which was essentially home-born, and had nothing similar to it in the Greek language. This species of composition appears to have arisen from the practice, which has prevailed in Italy from the earliest times to the present day, of the country-people making rude extempore verses in ridicule of one another. Lucilius, who was the contemporary of Scipio Africanus and of Lælius, with whom he lived on the most intimate terms of friendship, was the first writer who constructed Roman satires on those principles of art which were considered in the time of Horace as essential requisites in a satiric poem. (Hor., *Sat.*, ii. 1, 61.)

The first century before the Christian æra was the most brilliant epoch of Roman literature. The various writings of Cicero had brought the Roman language to perfection; and almost every species of literature was cultivated with success. In didactic poetry, Lucretius rivalled, and we may say surpassed, all the Greek didactic poets, in his great philosophical poem, which, for vigour of conception and splendour of diction, will bear comparison with the best efforts of the poets of any age and country. In lyric poetry, Catullus and Horace made the first attempts to introduce this species of composition among the Romans; while Tibullus, Propertius, and Ovid produced the most beautiful elegiac poems. During this period also, the epic poem of Virgil appeared; but there was no great dramatic poet. In prose, we possess the histories of Sallust, Cæsar, and Livy; the agricultural and antiquarian treatises of Varro; and the orations, letters, and philosophical and historical works of Cicero. The chief characteristic of the literature of this age originated in the leading feature of the Roman character. The Romans were a practical and not a speculative people; and consequently pure speculation found little favour and encouragement among them. No new system of philosophy sprung up amongst them; they received the different systems of Grecian philosophy without any modification or alteration; and even those who, like Cicero, studied this subject most successfully, appear only to have regarded it in a practical point of view, as a solace in adversity, or as an important auxiliary to the study of oratory. The latter subject, at least under the republic, was more studied than any other branch of literature, since it opened the way to the highest dignities in the state; and the influence of this study may be traced in almost all the works of the writers of this period. We especially see it in the 'Æneid' of Virgil, and in the histories of Sallust and Livy.

Second Period:—From the death of Augustus to the death of Marcus Aurelius, A.D. 180.—In this period the decay of the Latin literature commenced. By the overthrow of the republic, oratory was confined almost entirely to private causes, and soon degenerated into the art of the rhetorician. Quintilian made a noble but unsuccessful attempt to recall his contemporaries from the empty declamations of the schools to the true subjects of oratory; but a false taste had already vitiated the great bulk of the community. Oratory however still continued to form, as it had done under the republic, the chief study in the education of the higher classes; and consequently the false principles of taste on which it was taught may be traced in all the writings of that period. We see it in the works of Seneca, the younger Pliny, Velleius Paterculus, and even to some extent in those of Tacitus. In the poems of Lucan, Valerius Flaccus, and Silius Italicus, the art of the rhetorician is still more conspicuous; they abandoned the study of nature, and were constantly striving after effect; in addition to which, they were all close imitators of the 'Æneid,' which, from its deficiency in truth to nature, must have produced a most injurious effect upon subsequent poets, who made it their model. Under the Antonines the deterioration in the character of the literature became still more apparent, as we see in the writings of Solinus, Petronius, and Appuleius, though even during this period Gaius and other jurists continued to write Latin worthy of the age of Cicero.

Third Period:—From the death of Marcus Aurelius to the time of Cassiodorus, A.D. 539.—The civil commotions which prevailed during the early part of this period, and the subsequent removal of the seat of empire to Constantinople, almost extinguished all literary pursuits. The great mass of the Roman people had never been able to enjoy or appreciate the works of their countrymen; and when the patronage of the great and the wealthy was withdrawn, there was no encouragement to any literary exertions. The poets of this age, with the exception of Claudian, who was superior to most of the poets of the preceding period, were mere versifiers, as Olympius Nemesianus and Julius Calpurnius; the historians, if they may be dignified with the title, only composed the most barren epitomes of Roman history, or of the reigns of the emperors. All kinds of barbarisms and corruptions began to creep into the language; but even at the commencement of this period the jurists Ulpian, Papinian, Paullus, and Modestinus still continued to write in pure Latin, which forms a striking contrast with that of their contemporaries. The only literature of this age, besides the juristical, which deserves special mention, is that of the Christian church; in which the works of Lactantius are particularly distinguished by the purity of their style and the elegance of their diction.

The following is a list of the Latin writers, with their several epochs, as nearly as they can be ascertained:—

A.U.C.	B.C.	
514	240	Livius Andronicus.
521	235	Cn. Nævius.
535	219	Q. Fabius Pictor.
550	204	L. Cincius Alimentus.
554	200	M. Porcius Cato.
		Q. Ennius.
		M. Accius Plautus.
568	186	Cæcilius Statius.
588	166	M. Pacuvius.
		P. Terentius.
600	154	A. Postumius Albinus.
620	134	L. Attius.
		L. Calpurnius Piso Frugi.
		C. Fannius.
		C. Cœlius Antipater.
		Sempronius Asellio.
		C. Lucilius.
631	123	S. Turpilius.
640	114	L. Licinius Crassus.
656	98	M. Antonius.
		L. Ælius Stilo.
		Claudius Quadrigarius.
		Valerius Antias.
		L. Cornelius Sisenna.
663	91	L. Pomponius Bononiensis.
664	90	P. Rutilius.
		T. Quintius Atta.
666	88	Plotius Gallus.
673	81	Valerius Cato.
676	78	L. Cornelius Sulla.
		T. Lucretius Carus
690	64	Q. Hortensius.
694	60	M. Tullius Cicero.
		M. Terentius Varro.
		T. Pomponius Atticus.
		Q. Ælius Tubero.
		L. Lucceius.
700	54	C. Julius Cæsar.
		Atteius Philologus.
		C. Valerius Catullus.
		D. Laberius.
710	44	Cornelius Nepos.
		C. Asinius Pollio.
		A. Hirtius.
		C. Sallustius Crispus.
726	28	C. Cæsar Octavianus Aug
		M. Agrippa.
		C. Cilnius Mæcenas.
		C. Trebatius Testa.
		Q. Horatius Flaccus.
		P. Virgilius Maro.
		Cornelius Gallus.
		Albius Tibullus.
		M. Valerius Messalla Corv
730-767	24	S. Aurelius Propertius.
	A.D.	
767	14	Domitius Marsus.
		C. Pedo Albinovanus.
		M. Porcius Latro.
		Verrius Flaccus.
		Titus Livius.
		Trogus Pompeius.
		Q. Antistius Labeo.
		C. Ateius Capito.
		P. Ovidius Naso.
		Æmilius Macer.
		C. Rabirius.
		Cornelius Severus.
		Gratius Faliscus.
767-790	14-37	Phædrus.
		Manilius?
		C. Asinius Gallus.
		Massurius Sabinus.
		Cocceius Nerva.
		C. Velleius Paterculus.
		Valerius Maximus.
		M. Annæus Seneca.
		Arellius Fuscus.
		Albucius Silus.
		Cestius Pius.
		Q. Haterius.
		L. Arruntius.
		Rutilius Lupus.
794-807	41-54	Crispus Passienus.
		Domitius Afer.
		Julius Africanus.
		A. Cornelius Celsus.
		Pomponius Mela.
		L. Junius Moderatus Col
		Scribonius Largus.
		Q. Asconius Pedianus.
807-821	54-68	Nero.
		L. Annæus Seneca.
		M. Annæus Lucanus.
		Annæus Cornutus.
		A. Persius Flaccus.
		C. Silius Italicus.
		Aufidius Bassus.
		Valerius Probus.
822-832	69-79	C. Plinius Secundus (the el
		V. Messalla.
		Fabius Rusticus.
		Vibius Priscus.
		Julius Secundus.
		Saleius Bassus.
		C. Valerius Flaccus.
834-849	81-96	M. Fabius Quintilianus.
		M. Valerius Martialis.
		Sulpicia.
		P. Papinius Statius.

.C.	A.D.	
0	98-117	C. Cornelius Tacitus.
		C. Plinius Secundus Cæcilius.
		S. Julius Frontinus.
		Javolenus.
		C. Suetonius Tranquillus.
		L. Annæus Florus.
		Julius Obsequens.
		Velius Longus.
		Terentianus Maurus.
		D. Junius Juvenalis.
	131	Salvius Julianus.
		Cæcilius Africanus.
914	138-161	S. Pomponius.
		Gaius.
		Volusius Mæcianus.
		Cervidius Scævola.
		Ulpius Marcellus.
		Aulus Gellius.
		Calpurnius Flaccus.
		Justinus.
		Q. Curtius?
933	161-180	M. Aurelius Antoninus (Greek).
		Cornelius Fronto.
		L. Appulejus.
		Julius Solinus.
		Nonius Marcellus.
		Tertullianus.
		Petronius.
		Dionysius Cato.
983	200-250	Papinianus.
		Ulpianus.
		Paulus.
		Modestinus.
		Gargilius Martialis.
		Apicius.
		Censorinus.
		Minucius Felix.
7	284	M. Aurelius Olympius Nemesianus.
		Julius Calpurnius.
		Marius Maximus.
		Cæcilius Cyprianus.
		Trebellius Pollio.
		Julius Capitolinus.
		Flavius Vopiscus.
9	306	Julius Rufinianus.
		Arnobius.
		Lactantius.
		Firmicus Maternus.
3	360	Ælius Donatus.
		Victorinus.
		Aurelius Victor.
		Mamertinus.
		Eutropius.
		Rufus.
		L. Ampelius.
13	370	Hieronymus.
		Ambrosius.
		Anicius Paulinus.
		Ausonius.
		Ammianus Marcellinus.
		Vegetius.
		Priscianus.
		Marcellus Empiricus.
		Faltonia Proba.
48	395	Aurelius Symmachus.
		Claudianus.
		Pompeius Festus.
		Servius Maurus.
		Æmilius Probus.
		Augustinus.
		Aurelius Prudentius.
		Sulpicius Severus.
63	410	Macrobius.
		Claudius Rutilius Numatianus.
		Rufus Festus Avienus.
		Charisius.
		Diomedes.
		Cœlius Aurelianus.
		Paulus Orosius.
	450	Salvianus.
		Apollinaris Sidonius.
		Capella.
A.U.C.	A.D.	
		Arusianus Messius.
1253-1292	500-539	Boethius.
		Priscianus.
		Fulgentius.
		Tribonianus.
		Cassiodorus.

In the preceding list the principal Roman jurists are inserted, but a complete list of them, with the relative proportions, which they have contributed to the 'Digest,' is given under JUSTINIAN'S LEGISLATION, p. 164.

Works on the Roman Language and Literature.—The following list of works, though far from complete, may be useful to those who are studying the language and literature of antient Rome. It is hardly necessary to premise that the works here enumerated have very different degrees of merit, and that some are merely mentioned as the best or only works of the kind, or as the best known to the writer.

Literature.—Fabricius, 'Bibliotheca Latina,' edited by Ernesti, 3 vols. 8vo., Lips., 1773-1774; Harles, 'Introductio in Notit. Litt. Romanæ,' 2 vols. 8vo., Norimb., 1794; 'Brevior Notitia Litt. Romanæ,' with supplements, 5 vols. 8vo., 1789-1819; Dunlop, 'History of Roman Literature,' 3 vols. 8vo., Lond.; Bähr, 'Geschichte der Römischen Literatur,' 8vo., Carls., 1832, &c.; 'Abriss der Römischen Literaturgeschichte,' 8vo., Heidelb., 1833; Bernhardy, 'Grundriss der Römischen Literatur,' 8vo., Halle, 1830, a useful work; F. A. Wolf, 'Vorlesungen über die Geschichte der Römischen Literatur,' 8vo., Leipz., 1831; F. Passow, 'Uebersicht der Römischen und Griechischen Literatur, 4to., Berlin, 1815; 'Grundzüge der Griech. und Röm. Litteratur und Kunstgeschichte,' 4to., Berlin, 1829; Gyraldus, 'Historia Poetarum tam Græcorum quam Latinorum,' Basel, 1545; Crinitus, 'De Poetis Latinis,' Flor., 1505; Vossius, 'De Vet. Poetarum Temporibus,' Amst., 1654; Crusius, 'Lives of the Latin Poets,' Lond., 1726; Rambach, 'De Poetarum Lyricorum inter Romanos Paucitate,' 4to., Quedlinb., 1769; Lévée, 'Théâtre complet des Latins,' Paris, 1822, &c.; Donatus, 'De Tragœdia et Comœdia;' J. C. Scaliger, 'De Comœdia et Tragœdia,' in Gronovius's 'Thesaurus Ant. Gr.,' vol. viii.; Sagittarius, 'De Vita et Scriptis Livii Andronici, Nævii, Ennii, Cæcilii, Statii, Pacuvii, &c.' 8vo., Altenb., 1672; A. W. Schlegel, 'Vorlesungen über Dramatische Kunst und Litteratur,' 3 vols. 8vo., Heidelb., 1817, translated into French, 3 vols. 8vo., Paris, 1814, and into English, 2 vols. 8vo.; the article DRAMA in this work; Casaubon, 'De Satyrica Graec. Poesi et Romanorum Satira,' Par., 1605, Hal., 1774, ed. Rambach; König, 'De Satira Romana,' Oldenb., 8vo., 1796; Manso, 'Ueber die Römischen Satiriker,' in Sulzer's 'Allgem. Theorie der Schönen Künste,' vol. 4; Ruperti, 'De Satira Romanorum et de Satiricis Romanorum Poetis,' prefixed to his edition of Juvenal; Vossius, 'De Historicis Latinis,' Lugd. Bat., 1651.

A list of the principal editions of the Latin writers, with the best modern works upon each writer, is given in Wagner's 'Grundriss der Classichen Bibliographie,' Breslau, 1840.

Language.—Folieta, 'De Ling. Lat. Usu et Præstantia,' ed. Mosheim, Hamb., 1723, 8vo.; Facciolati, 'De Ortu, Interitu, et Instauratione Linguæ Latinæ,' reprinted at Lips., 1725; Tursellinus, 'De Particulis Latinæ Orationis,' often reprinted; Allen, 'Doctrina Copularum Linguæ Latinæ,' 12mo., Lond., 1830, with a notice of the same work in the 'Journal of Education,' No. 8; Döderlein, 'Lateinische Synonyme und Etymologieen,' 6 vols. 8vo., Leipz., 1826-1838; Struve, 'Ueber die Lateinische Declination und Conjugation,' 8vo., Königs., 1823; Schneider, 'Elementarlehre der Lateinischen Sprache,' and 'Formenlehre der Lateinischen Sprache,' Berlin, 1819, 1821, a valuable work for the archæology of the language; Allen, 'Etymological Analysis of Latin Verbs,' 12mo. Lond., 1836; Scheller, 'Ausfürhliche Lateinische Sprachlehre,' 8vo., Leipz., 1803, translated into English by Walker; Grotefend, 'Ausfürhliche Grammatik der Lateinischen Sprache,' 2 vols. 8vo., Hannov., 1829-30; Zumpt, 'Lateinische Grammatik,' 8vo., Berlin, 6th edition, 1828, and frequently reprinted, translated into English by Kenrick, with a notice of the same work in the 'Quarterly Journal of Education,' No. 1: this grammar is far superior in the syntactical part to any other. The student will also derive considerable information from those works which treat of the comparative grammar of the Indo-Germanic Languages, as Bopp's 'Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, &c.,' of which the first part was published at Berlin, 1833, with a notice of the same work in the 'Journal of Education,' No. 16, by the late Dr. Rosen; and Pott's 'Etymologische Forschungen auf dem Gebiete der Indo-Germanichen Sprachen,' 2 vols. 8vo., Lemgo, 1833-36, with two notices of the same in the 'Journal of Education,' Nos. 18, 20, also by Dr. Rosen.

Dictionaries.—Stephani, 'Thesaurus Linguæ Latinæ;' Facciolati and Forcellini, 'Totius Latinitatis Lexicon,' 4 vols. fol., Padua, 1771, which is superior to all other Latin dictionaries, and the recent edition of the same work enlarged by Furlanetto, 4 vols. 4to., Padua; Adam, 'Dictionary of the Latin Tongue,' 8vo., Edinburgh, 1814, 2nd edition, a superior work to that of Ainsworth: Scheller, 'Ausführliches und Möglichst Vollständiges Lateinisch-Deutsches und Deutsch-Lateinisches Lexicon,' 5 vols. 8vo., Leipz., 1804-6, translated into English by Riddle, who has also published a Latin dictionary in one volume, 8vo.; Freund, 'Wörterbuch der Lateinischen Sprache,' which is to be completed in 4 vols. 8vo., but three only have yet appeared; Schwenck, 'Etymologisches Wörterbuch der Latein. Sprache mit Vergleichung der Griechischen und Deutschen,' 8vo, Francf., 1827; Nizolii, 'Lexicon Ciceronianum,' edited by Facciolati, reprinted in London, 3 vols. 8vo., 1820.

ROMAN LAW.

The historical origin of the Roman Law is unknown, and its fundamental principles, some of which even survived the legislation of Justinian, are older than the oldest records of Italian history. The foundation of the strict rules of the Roman law as to familia, agnatio, marriage, testaments, succession to intestates, and ownership, was no doubt custom, which, being recognised by the sovereign power, became law. As in many other states of antiquity, the connection of the civil with the ecclesiastical or sacred law was most intimate; or rather, we may consider the law of religion as originally comprehending all other law, and its interpretation as belonging to the priests and the king exclusively. There was however direct legislation even in the period of the kings. These laws, which are mentioned under the name of Leges Regiae, were propsed by the king, with the approbation of the senate, and, confirmed by the populus in the Comitia Curiata, and, after the constitution of Servius Tullius, in the Comitia Centuriata. That there were remains of this antient legislation existing even in the Imperial period, is certain, as appears from the notice of the Jus Civile Papirianum or Papisianum, which the Pontifex Maximus Papirius is said to have compiled from these sources, about or immediately after the expulsion of Tarquinius Superbus (*Dig.*, i., tit. 2), and from the distinct references to these Leges made by late writers. Still there is great uncertainty as to the exact date of the compilation of Papirius, and its real character. Even his name is not quite certain, as he is variously called Caius, Sextus, and Publius. (Dion. Hal., iii. 36; *Dig.*, i., tit. 2.)

But the earliest legislation of which we have any important remains is the compilation of the code called the Twelve Tables. The original bronze tables indeed are said to have perished in the conflagration of the city after its capture by the Gauls, but they were satisfactorily restored from copies and from memory, for no antient writer who cites them ever expresses a doubt as to the genuineness of their contents. It is the tradition that a commission was sent to Athens and the Greek states of Italy, for the purpose of examining into and collecting what was most useful in their codes; and it is also said that Hermodorus of Ephesus, then an exile in Rome, gave his assistance in the compilation of the code. There is nothing improbable in this story, and yet it is undeniable that the laws of the Tables were based on Roman and not on Greek or Athenian law. Their object was to confirm and define perhaps rather than to enlarge or alter the Roman law, and it is probable that the laws of Solon and those of other Greek states, if they had any effect on the legislation of the Decemviri, served rather as models of form than as sources of positive rules.

Ten tables were completed and made public by the Decemviri, in B.C. 451, and in the following year two other tables were added. This compilation is quoted by the antient writers by various titles: Lex XII. Tabularum, Leges XII., sometimes XII. simply (Cic., *Legg.*, ii. 23), Lex Decemviralis, and others. The rules contained in these tables long continued to be the foundation of Roman law, and they were never formally repealed. The laws themselves were considered as a text-book, and they were commented on by the Jurists as late as the age of the Antonines, when Gaius wrote a commentary on them in six books ('Ad Legem XII. Tabularum'). The actions of the old Roman law, called Legitimae, or Legis Actiones, were founded on the provisions of the Twelve Tables, and the demand of the complainant could only be made in the precise terms which were used in the Tables. (Gaius, iv. 11.) The rights of action were consequently very limited, and they were only subsequently extended by the Edicts of the Praetors. The brevity and obscurity of this antient legislation rendered interpretation necessary in order to give the laws any application; and both the interpretation of the laws and the framing of the proper forms of action belonged to the College of Pontifices, who yearly appointed a member of their own body to decide in all doubtful cases. The civil law was thus still inseparably connected with that of religion (Jus Pontificium), and its interpretation and the knowledge of the forms of procedure were still the exclusive possession of the patricians.

The scanty fragments of the Twelve Tables hardly enable us to form a judgment of their character or a proper estimate of the commendation bestowed on them by Cicero (*De Or.*, i. 43). It seems to have been the object of the compilers to make a complete set of rules both as to religious and civil matters; and they did not confine themselves to what the Romans called private law, but they comprised also public law. ('Fons publici privatique juris,' Liv., iii. 34.) They contained provisions as to testaments, successions to intestates, the care of persons of unsound mind, theft, homicide, interments, &c.

They also comprised enactments which affected a man's status, as for instance the law contained in one of the two last Tables, which did not allow to a marriage contracted between a patrician and a plebeian the character of a legal Roman marriage, or, in other words, declared that between patricians and plebeians there could be no Connubium. Though great changes were made in the Jus Publicum by the various enactments which gave to the plebeians the same rights as the patricians, and by those which concerned public administration, the fundamental principles of the Jus Privatum, which were contained in the Tables, remained unchanged, and are referred to by jurists as late as the time of Ulpian.

The old Leges Regiae, which were collected into one body by Papirius, were commented on by Granius Flaccus in the time of Julius Cæsar (*Dig.*, 50, tit. 16, s. 144), and thus they were probably preserved. The fragments of these laws have been often collected, but the best essay upon them is by Dirksen, 'Versuchen zur Kritik und Auslegung der Quellen des Römischen Rechts,' Leipzig, 1823. The fragments of the Twelve Tables also have been often collected. The best work on the subject is that by James Godefroy (Jac. Gothofredus), which, with the more recent work of Dirksen, 'Uebersicht der bisherigen Versuche zur Kritik und Herstellung des Textes der Zwölf-Tafel-Fragmente,' Leipzig, 1824, seems to have exhausted the subject.

For about one hundred years after the Legislation of the Decemviri, the patricians retained their exclusive possession of the forms of procedure. Appius Claudius Cæcus drew up a book of the forms of actions, which it is said that his clerk Cnaeus Flavius stole and published; the fact of the theft may be doubted, though that of the publication of the forms of procedure, and of a list of the Dies Fasti and Nefasti, rests on sufficient evidence. The book thus made public by Flavius was called Jus Civile Flavianum; but like that of Papirius it was only a compilation. The publication of these forms must have had a great effect on the practice of the law: it was in reality equivalent to an extension of the privileges of the plebeians. Subsequently Sextus Aelius published another work, called 'Jus Aelianum,' which was more complete than that of Flavius. This work, which was extant in the time of Pomponius (*Dig.*, i., tit. 2, s. 2, § 39), was also called 'Tripertita,' from the circumstance of its containing the laws of the Twelve Tables, a commentary upon them (interpretatio), and the Legis Actiones. This work of Aelius appears to have been considered in later times as one of the chief sources of the civil law (veluti cunabula juris); and he received from his contemporary Ennius the name of 'wise:'

'Egregie Cordatus homo Catus Aelius Sextus.'

Aelius was Curule Aedile, B.C. 200, and Consul, B.C.

he Republican period new laws (leges) were enacted
the Comitia Centuriata and in the Comitia Tributa.
eges Curiatae, which were enacted by the curiae,
mited to cases of adrogation and the conferring of
perium. The Comitia Centuriata were made inde-
t of the senate by the Lex Publilia (Liv., viii. 12),
declared that the leges passed in these Comitia
not require the confirmation of the senate. The
assed in the Comitia Tributa were properly called
Tributae or Plebiscita, and originally they were
proposals for a law which were laid before the senate
nfirmed by the curiae. But the Lex Publilia (B.C.
nd subsequently the Lex Hortensia (B.C. 286), gave
Plebiscita the full force of leges without the con-
the senate (Liv., viii. 12; Gaius, i. 3; Gell., xv. 27);
Plebiscitum was accordingly sometimes called a lex.
ges generally took their name from the gentile name
agistrate who proposed them (rogavit), or, if he was
l, from the name of both consuls, as Lex Aelia or Aelia
Papia or Papia Poppaea. If the proposer of the law
ictator, praetor, or tribune, the Lex, or Plebiscitum,
ase might be, took its name from the proposer only,
Hortensia. Sometimes the object of the lex was in-
by a descriptive term, as Lex Cincia de donis et mu-

Senatus Consulta also formed a source of law under
blic. That a senatus consultum in the time of Gaius
hould have the force of law (vicem legis optinet),
easily admitted; but Gaius in this passage appears
eferring not only to such senatus consulta as had
ssed under the empire, but to the senatus consulta
ly as a source of law. It appears that the senate
ly came to be considered as the representative of the
and that its consulta, in many matters relating to
tration, the care of religion, the aerarium, and the
tration of the provinces, had the full effect of laws.
not seem as if the Romans themselves had a very
tion of the way in which the senate came to exercise
er of legislation; but they imagined that it arose of
y with the increasing population of the state
e increase of public business. The senate thus
an active administrating body, and, as an easy con-
e, that which it enacted (constituit) was observed,
s new source of law was termed Senatus Consultum
i., tit. 2). It seems probable that the senate began
ise the power of making senatus consulta after the
of the Hortensia Lex, though it is not pretended
e Hortensia Lex or any other Lex gave this power to
ate. No senatus consulta are recorded as designated
ames of magistrates, till the time of Augustus, a cir-
nce which seems to show that whatever binding au-
senatus consulta might have acquired under the
ic, they were not then viewed as laws properly so
or as having the full effect of leges. But from the
Augustus, the titles of senatus consulta frequently
their names, like those of the leges, were derived
e consuls, as S. C. Velleianum, Pegasianum, Trebel-
&c., or of the emperor who proposed them, as S. C.
num, Neronianum, &c., or they were said to be made
e Principe,' or 'ex auctoritate Principis.' The expres-
plied to the senate, so enacting, was 'censere.' (Gaius,
Special consulta were sometimes passed for the pur-
explaining or rendering effectual previous leges.
w source of law was supplied by the Edicta of those
ates who had the Jus Edicendi, but mainly by the
s, the praetor urbanus and the praetor peregrinus.
cts of the praetor urbanus were the most important.
dy of law which was formed by the Edicta is accord-
ometimes called Jus Praetorium, which term how-
ight be limited to the Edicta of the praetors, as
l to those of the curule aediles, the tribunes, cen-
d pontifices. The name Jus Honorarium, as opposed
Civile, comprehends the whole body of edictal law;
e name Honorarium was given to it, apparently be-
he Jus Edicendi was exercised only by those magis-
who had the Honores. Jus Civile in its larger sense
hended all the law of any given nation; but the
ivile Romanorum, as opposed to the Honorarium,
ed of Leges, Plebiscita, Senatus Consulta, to which,
the empire, were added the Decreta Principum
Auctoritas Prudentium. The Honorarium Jus was introduced for the purpose of aiding, supplying, and correcting the defects of the Jus Civile Romanorum in its limited sense. (*Dig.*, i., tit. 1, s. 7.)

The historical origin of the edictal power is not known, but in the time of Cicero it had been so long exercised, and the Edicta had been so far formed into a regular system, that the study of the edictal law was a main part of the systematic study of the Roman law, and had taken the place of the Twelve Tables as an elementary branch of instruction. (Cic., *Legg.*, ii. 4, 23; i. 5.) Servius Sulpicius, a distinguished jurist and a friend of Cicero, wrote two small books on the Edict, which were followed by a work of Ofilius, also on the Edict. Though the history of the edictal law, as already observed, cannot be traced, it thus appears that it had assumed a systematic form in the time of Cicero.

An Edictum was a rule promulgated by a magistratus when he entered on his office. It was committed to writing and put up in a public place. Its object was to declare by what rules the praetor would be governed in the administration of justice during the year of his office; and hence the Edictum was sometimes called Perpetuum or Annua Lex. An Edictum Repentinum applied only to the particular occasion on which it was made. All offices being annual, the rules of one magistratus were not binding on his successor, but his successor might adopt them into his own Edictum, and such adopted Edictum then became an Edictum Tralatitium. In this way numerous Edicta were adopted by one magistratus from the Edicta of his predecessors, and thus gradually a body of rules was formed and established, which experience had proved to be useful. Those Edicta which were of great importance are often referred to under the name of the magistratus who promulgated them, as the Edictum Carbonianum and others.

The general character of the Edict has been already stated. It is described in other words as 'viva vox juris civilis,' as a mode by which the rigid rules of the civil law were altered and extended to suit the altered circumstances of the times. The changes introduced by positive enactments into the Jus Privatum of the Roman law seem to have been very unimportant. It was not consistent with Roman notions to alter or change fundamental principles, and most of the legislation of the republican period had reference to the disputes between the two estates of the patricians and plebeians, and to other parts of the Jus Publicum. Accordingly it was left to the magistratus gradually to introduce the necessary changes into the Jus Privatum; but the process of doing this was in strict conformity to the principles of the old law. The Edict did not affect to make new law, but to adopt as law what custom had sanctioned, provided it was not against the Jus Civile; to give an action when a bonâ fide right existed, if the old law gave none; to protect a man in bonâ fide possession of property, without affecting to give him ownership, which the law alone could give him by virtue of usucapion; to aid parties by fictions, which however were always of such a kind that the thing which the fiction supposed, was that which would have given a strictly legal right. A great part of the efficacy of the Edict consisted in extending the remedies by action; and after the abolition of the Legis Actiones (with the exception of the Actio Damni Infecti, and of matters which belonged to the cognizance of the Centumviri) by the Lex Aebutia and two Leges Juliae, the mode of proceeding in actions was settled by the formulæ of the Edicta. Still even here it seems probable that the praetors followed the analogy of the Legis Actiones and framed their formulæ accordingly. The Actiones given by the Edict were named after their author, as Publiciana, &c. The commentators on the Edicts were numerous under the early emperors. Labeo wrote at least four books on the Edictum of the Prætor Urbanus. Cœlius Sabinus commented on the Edict of the Curule Aediles. In the time of Hadrian, Salvius Julianus, who had himself been prætor, compiled a work on the Edict, which was called Edictum Perpetuum. Nothing is known of the detail of this work, but it appears probable that it was designed to be a systematic exhibition of the whole body of edictal law, and as such it must have had considerable influence on the subsequent condition of jurisprudence. At what time the Edicta ceased to be made by the magistratus is a disputed point. The edictal power certainly existed under the empire, and even after the compilation of the Edictum Perpetuum of Julianus, but it must have been comparatively little exercised, as the practice of making new laws by Senatus Consulta prevailed under the Cæsars after the time of Augustus, and the Imperial Constitutions are mentioned as one of the recognised sources of law in the time of the Antonines. (Gaius, i. 5.)

With the establishment of the Imperial Constitution begins a new epoch in the Roman law. The leges of Augustus and those of his predecessor had some influence on the Jus Privatum, though they did not affect the fundamental principles of the Roman law. A Lex Julia came into operation, B.C. 13, but it is better known as the Lex Julia et Papia Poppaea, owing to the circumstance of another lex of the same import, but less severe in its provisions, being passed as a kind of supplement to it in the consulship of M. Papius Mutilus and Q. Poppaeus Secundus, A.D. 9. This law had for its object the encouragement of marriage, but it contained a great variety of provisions: it is not known whether it was passed at the Comitia Centuriata or Tributa. A Lex Julia de Adulteriis, which also contained a chapter on the dos, is of uncertain date, but was probably passed before the former Lex Julia came into operation. Several Leges Juliae Judiciariae are also mentioned, which related both to Judicia Publica and Privata, and some of which may probably belong to the time of the dictator Cæsar.

The development of the Roman law in the Imperial period was little affected by direct legislation. New laws were made by Senatus Consulta, and subsequently by the Constitutiones Principum; but that which gives to this period its striking characteristic is the effect produced by the Responsa and the writings of the Roman jurists.

So long as the law of religion or the Jus Pontificium was blended with the Jus Civile, and the knowledge of both was confined to the patricians, jurisprudence was not a profession. But with the gradual separation of the Jus Civile and Pontificium, which was partly owing to the political changes by which the estate of the plebeians was put on a level with that of the patricians, there arose a class of persons who are designated as Jurisperiti, Jurisconsulti, Prudentes, and by other equivalent names. Of these jurisconsulti the earliest on record is Tiberius Coruncanius, a plebeian pontifex maximus, and consul B.C. 281: he is said to have been the first who professed to expound the law to any person who wanted his assistance (publice profiteri); he left no writings, but many of his Responsa were recorded. Tiberius Coruncanius had a long series of successors who cultivated the law, and whose responsa and writings were acknowledged and received as a part of the Jus Civile. The opinions of the jurisconsulti, whether given upon questions referred to them at their own houses, or with reference to matters in litigation, were accepted as the safest rule by which a judex or an arbiter could be guided. Accordingly, the mode of proceeding, as it is described by Pomponius, is perfectly simple; the judices in difficult cases took the opinion of the jurisconsulti, who gave it either orally or in writing. Augustus, it is said, gave the responsa of the jurists a different character. Before his time, their responsa, as such, could have no binding force, and they only indirectly obtained the character of law by being adopted by those who were empowered to pronounce a sentence. Augustus gave to certain jurists the respondendi jus, and declared that they should give their responsa 'ex ejus auctoritate.' In the time of Gaius (i., 7) the Responsa Prudentium had become a recognised source of law; but he observes that the responsa of those only were to be so considered who had received permission to make law (jura condere); and he adds that if they all agreed, their opinion was to be considered as law; if they disagreed, the judex might follow which opinion he pleased. The matter is thus left in some obscurity, and, for want of more precise information, we can only conjecture what was the precise way in which these licensed jurists under the empire were empowered to declare the law. It is however clear, both from the nature of the case and the statement of Gaius, that their functions were limited to exposition, or to the declaration of what was law in a given case, and that they had no power to make new rules of law as such; further, the licensed jurists must have formed a body or college, for otherwise it is not possible to conceive how the opinions of the majority could be ascertained on any given occasion.

The commencement of a more systematic exposition of law under the empire is indicated by the fact of the existence of two distinct sects or schools (scholae) of jurists. These schools originated under Augustus, and the heads of
each were respectively two distinguished jurists,
Labeo and Ateius Capito. But the schools took the
from other jurists. The followers of Capito's scho
Sabiniani, derived their name from Massurius S
pupil of Capito, who lived under Tiberius and a
the time of Nero: sometimes they were called
from C. Cassius Longinus, another distinguished
Capito. The other school was called Proculiani, fro
lus, a follower of Labeo. If we may take the aut
Pomponius, the characteristic difference of the tw
was this: Capito adhered to what was transmitted
he looked out for positive rules sanctioned by time; L
more learning and a greater variety of knowledge,
cordingly he was ready to make innovations, for
more confidence in himself; in other words, he w
losophical more than an historical jurist. Ga
was himself a Sabinian, often refers to discre
opinion between the two schools, but it is not easy
from the instances which he mentions, what ou
considered as their characteristic differences.

The jurisprudentes were not only authorised ex
of law, but they were most voluminous writers. M
Sabinus wrote three books Juris Civilis, which fo
model of subsequent writers. The commentators
Edict were also very numerous, and among them
names of Pomponius, Gaius, Ulpian, and Paulus.
wrote an elementary work, which furnished the
the Institutes of Justinian. Commentaries were als
on various Leges, and on the Senatus Consulta of
perial period; and finally, the writings of the earli
themselves were commented on by their successo
long series of writers to whom the name of classica
has been given, ends, about the time of Alexander
with Modestinus, who was a pupil of Ulpian. S
may be formed of the vast mass of their writings
titles of their works as preserved in the 'Digest,' a
the 'Index Florentinus;' but with the exception of
ments which were selected by the compilers of that w
great mass of juristical literature is nearly lost. [Jus

Among the sources of law in the Imperial period
Imperial Constitutiones. A Constitutio Principis i
by Gaius (i. 5) to be 'that which the imperator ha
tuted by Decretum, Edictum, or Epistola: nor ha
been doubted that such constitutio has the force
As the emperor ultimately possessed all the sovereig
he became the sole source of law. Under Augus
Leges were passed, as already observed: and under
cessors there were numerous Senatus Consulta. In
of the Antonines there were both Senatus Consulta
perial constitutions, and the latter are referred to
as being of equally binding force with Senatus
After the time of Gaius, Constitutiones became m
mon, and few Senatus Consulta were passed. The D
of the emperor was a decision made in a matter of
which came before him either originally or by way o
The Edict, or Leges Edictales, were formed by
to the Edicta of the magistrates, and were in effe
Rescriptum was a general term which comprehend
tolæ and Subscriptiones. The Rescripta were the an
the emperor, made either to public functionaries o
viduals who consulted him. Sometimes Constit
Rescriptum are used as equivalent. (Gaius, ii. 1
Decreta and Rescripta, being decisions in particul
could not by their form have the force of leges:
when the determination made in a particular
capable of a general application, it gradually obta
force of law.

With the decline of Roman jurisprudence b
period of compilations, or codes, as they were term
earliest were the Codex Gregorianus and Hermog
which are only known from fragments. The Co
gorianus, so far as we know it, began with constit
Sept. Severus, and ended with those of Dioclet
Maximian. The Codex Hermogenianus, so far
known, contained constitutions also of Diocletian a
mian, and perhaps some of a later date. Thoug
codes were mere private collections, they apparen
to be considered as authority, and the codes of Th
and Justinian were formed on their model.

The code of Theodosius was compiled under the a
of Theodosius II., emperor of the East. It was
gated as law in the Eastern empire, A.D. 438: and
same year it was confirmed as law in the Western e

nian III. and the Roman senate. This code con-
sixteen books, the greater part of which, as well as
Novellæ, subsequently promulgated by Theodosius
extant in their original form. The commission who
d it were instructed to collect all the Edicta and
enerales from the time of Constantine, and to follow
lex Gregorianus and Hermogenianus as their model.
the arrangement of the subsequent code of Justi-
ffers considerably from that of Theodosius, it is clear
comparison of them that the compilers of Justinian's
re greatly aided by that of his Imperial predecessor.
uable edition of the Theodosian Code, by J. Gotho-
6 vols. fol., Lugd., 1665), re-edited by Ritter, Leipzig,
'45, contains the first five books and the beginning
ixth, only as they are epitomized in the Breviarium;
is also the case with the edition of the 'Jus Civile
stinianeum,' published at Berlin in 1815. But recent
ries have greatly contributed to improve the first five

The most recent edition of the 'Jus Civile Antejus-
m' is that of Bonn, 1835 and 1837.

legislation of Justinian is treated of under Jus-
's LEGISLATION.

e are numerous works on the history of the Roman
t it will be sufficient to mention a few of the more
as they contain references to all the earlier works·
h *der Geschichte des Römischen Rechts*, by Hugo,
h there are numerous editions: *Geschichte des Rö-
Privatrechts*, by Zimmern; *Geschichte des Rö-
Rechts*, by F. Walter, 1840; and for the later his-
he Roman law, *Geschichte des Römischen Rechts im
lter*, by Savigny.

HISTORY OF MODERN ROME.

d *I.:—Rome under the Gothic Kings.*—After the
f Valentinian III., A.D. 455, the foreign mercenary
disposed of the crown of the West. A rapid suc-
of puppet emperors followed each other on the
throne. At last Odoacer, an officer of the Imperial
of Gothic birth, some say of the tribe of the Heruli,
l against Orestes, another barbarian officer who had
d the supreme power in the name of his son Ro-
a mere youth, whose mother was a Roman by birth,
om he caused to be proclaimed Augustus. The
tion of Romulus Augustulus was given him in de-
Odoacer defeated Orestes, took him prisoner, and
n to death. Romulus was deposed, and banished
pania or Apulia, with a suitable allowance for his
, A.D. 476. Odoacer fixed his residence at Ravenna,
redecessors had done. He styled himself 'Patrician,'
fessed to govern Italy in the name of Zeno, emperor
East. He did not assume the purple or other im-
nsignia, although historians style him 'Rex.' There
oins struck in his name; nor did he make any new
tions or enactments. The form of administration
ed as before. Rome had its senate, its præfectus
o, and præfectus urbi. The consuls had been ap-
, ever since the time of Arcadius and Honorius, sepa-
one in the East and the other in the West. In the
after Odoacer's assumption of power, there was no
amed for the West. Zeno refused to appoint one,
r that he might not countenance the usurpation of
r; and Odoacer did not appoint one himself, not
to irritate Zeno. At last, in the year 480, on the
ntation of the senate, Odoacer named Basilius,
consul for the West, and he continued to appoint a
every following year. In the year 483, Simplicius,
of Rome, having died, the clergy assembled to elect
essor, in the presence of the præfect of the præ-
who signified to the assembly, in the name of
r, that no election of the bishop of Rome should be
n future without the sanction of the præfect. Felix
n declared to be elected. In the same year Theo-
chief of the Ostrogoths, of the tribe of the Amali,
hich circumstance he is called Theodoric Amalus, to
uish him from another Theodoric, his contemporary,
peace with the emperor Zeno, who appointed him
l of his guards, bestowed upon him part of Dacia
ia, and named him consul for the East for the
g year. In the year 487 Odoacer defeated and took
r Fava or Feba, a chief of the Rugi, who had
hi elf of part of Noricum. Frederic, son of
pp u to Theodoric, who was residing at Novæ in
, an who was related to him, and this was the origin or the pretext of the quarrel between Theodoric and Odoacer. It appears that Zeno had entered into a secret agreement with Theodoric to the effect that Theodoric should take Italy from Odoacer, probably however on the condition of acknowledging the emperor of the East as his suzerain. In the year 489 Theodoric moved towards Italy with the whole tribe of Ostrogoths, his subjects carrying along with them in carts their wives, children, cattle, corn, and other provisions, and even their hand-mills. Odoacer met the invaders on the banks of the Isonzo; but being defeated, he retreated to Verona; and after a second defeat he shut himself up in Ravenna. Theodoric advanced to Milan and Pavia; but having met with some reverses, he was obliged to keep himself within Pavia. In the following year, 490, Odoacer advanced against him, assisted by some troops sent him by Alaric, king of the Visigoths of Gaul and Spain. A battle took place, in which Odoacer being again defeated, he withdrew to Ravenna, whither Theodoric followed him, and fixed his camp in the neighbouring pineta, or pine-forest. The siege lasted more than two years, during which all the rest of Italy submitted to Theodoric. At last Odoacer surrendered through famine, in February, 493. Theodoric made his entrance into Ravenna, and was received by the archbishop at the head of his clergy. At first he treated Odoacer with kindness, but he afterwards caused him to be put to death.

Theodoric sent to Constantinople Festus, princeps or president of the Roman senate, to request of the emperor Anastasius, who had succeeded Zeno, the royal robe, or, in other words, the investiture of the kingdom of Italy, which Anastasius granted, and Theodoric assumed the title of king. He fixed his residence at Ravenna, and did not visit Rome for several years after his accession. In the year 498 Anastasius II., bishop of Rome, having died, great disturbances took place on the occasion of electing his successor. The majority of the clergy elected Symmachus, but another party named a certain Laurentius. The two parties came to blows, many persons were killed, and anarchy prevailed in Rome for a long time. Theodoric, who was an Arian, did not, perhaps through policy, interfere in the quarrel. At last, both parties, being tired of dissension and disorder, appealed to him, when he summoned the two claimants to Ravenna, and declared Symmachus to be duly elected by a majority of votes. In the year 500 Theodoric visited Rome, where he was received by Symmachus, and by the senate and the people, with great pomp. He visited the Vatican Basilica and the Senate-hall; and lastly he addressed the people in a place called Palma, promising to maintain the existing constitutions enacted by the former emperors. An old chronicler quoted by Muratori, who has written the life of St. Fulgentius, and who was present at the ceremony, speaks in high terms of the decorum, splendour, and order which prevailed, and of the applauses of the people. Theodoric gave public games in the Circus for the amusement of the people, and an annual donation of twenty thousand measures of corn. He assigned also two hundred pounds of gold annually out of the revenue of the duty on wine for repairing the imperial palace and the city walls. He named Liberius prefect of the prætorium; and after having published several edicts, and caused the solemn promise that he had made to the people to be engraved on a brass tablet, which was fixed up in a public place, he returned to Ravenna.

The long reign of Theodoric was for Rome and all Italy a period of peace and prosperity. He himself carried on war in Gaul and in Spain, and added part of those countries to his dominions. He gave in marriage his only legitimate child Amalasonta to Eutaric, a noble Goth, who was appointed consul and colleague of the emperor Justinus in the consulship, A.D. 519. Justinus himself sent to Eutaric the consular toga. Eutaric made his solemn entrance into Rome on the first day of the year, and was received with great pomp by the senate amidst the applause of the people. The usual gifts were distributed among the people, both Romans and Goths; public games were given, among others fights of wild beasts, which had not been seen for a long time; the beasts were sent from Africa as a present by Trasmund, king of the Vandals. The magnificence displayed by the Romans on this occasion is said to have surprised even the ambassador from the emperor Justinus, who had come to treat of a reconciliation between the Eastern and Western churches, after the schism occasioned by Acacius. The report of this ambassador, on his return to Constantinople, of what he had seen at Rome, seems to have excited the jealousy and emulation of the Eastern court, and when, two years after (A.D. 521), Justinian was made consul in the East, he strove to rival Eutaric in the splendour of the public games, and the sums which he distributed among the people of Constantinople.

Under THEODORIC more particulars are given of his long and important reign; here we confine ourselves to those which concern more especially the city of Rome. That prudent king strove to win the affection of the people of Rome by his liberality, his respect for their municipal customs and privileges, his deference towards the senate, which was the supreme court of justice in his dominions, and his protection of the Roman church and clergy. The works of Cassiodorus, and the panegyric of Theodoric by Ennodius, bishop of Pavia, are evidence of this. Illiterate himself, Theodoric encouraged literature and science, and it appears, from one of the letters written in his name by Cassiodorus, that a great number of students from distant countries repaired to Rome. Theodoric enacted that the students should not leave Rome till they had completed a certain course of studies according to their respective pursuits, which was probably ascertained by an examination, and this may have led, in course of time, to the establishment of academical degrees. Towards the end of his life Theodoric became suspicious, because he perceived, that notwithstanding all he had done for Italy, there was still in the hearts of the native Italians a dislike of foreign domination. It was then that the patrician Severinus Boethius, being accused of treason, was tried and condemned to death by the senate of Rome, a sentence which was at first commuted by Theodoric into perpetual imprisonment, but after a time Boethius was put to death, and shortly after Theodoric put to death also the patrician Symmachus, the father-in-law of Boethius. John I., bishop of Rome, on his return from Constantinople, whither Theodoric had sent him on a mission to Justinus, was imprisoned by his order, probably on suspicion of treasonable intelligence with the Byzantine court, and he died in prison at Ravenna, A.D. 526. The clergy of Rome having assembled to elect a successor, dissensions arose which threatened a renewal of the disorders that had taken place at the former election of Symmachus. Theodoric wrote to the senate of Rome suggesting Felix, a man of great merit, as a fit candidate, and his suggestion, which was like a command, was complied with. This was one of the last acts of Theodoric. He died at Ravenna, of a violent dysentery, in August of the same year. Before he died, he sent for his grandson Athalaric, then 10 years of age (Eutharic had died before him), and causing his chief officers, both civil and military, to swear allegiance to him, he exhorted them to maintain a good understanding with the emperor of the East, and to cherish the Roman senate and the Roman people.

One of the first acts of Athalaric, or rather of his mother, Amalasonta, and her minister Cassiodorus in his name, was to signify his accession to the senate and the people of Rome. A letter was afterwards written to the senate expressing satisfaction that in choosing Felix for their bishop the Romans had conformed to the desire of his grandfather, which had been expressed with a view to the public good by recommending to them a person well deserving of the pastoral dignity. Some years after, when Boniface II. died, he indicated in his will a certain Vigilius as his successor in the see of Rome. This however was resented by the clergy and people as an improper interference, and being set aside, John II. was elected, A.D. 532. But as much bribery and corruption had been employed by the rival parties at the election, the senate passed a consultum forbidding under severe penalties any bribe or promise for the purpose of obtaining a see, which was declared to be a sacrilegious offence. All such promises were also declared to be void. Election disputes were to be decided by the senate or other judicial courts, but the expenses of the suit were not to exceed the sum of three thousand solidi, if it concerned the see of Rome, and of two thousand if it concerned other metropolitan sees. This decree, with the sanction of Athalaric, was engraved on marble and placed in the front of the Vatican Basilica. Athalaric left to the clergy and the people of Rome the right of electing their bishop, but reserved to himself that of confirming the election.

Amalasonta had begun her regency with great wisdom; she had been carefully brought up, by her father's directions, and she caused her son to be educated, after the manner of the Romans, in the liberal arts. It seems however that the Gothic officers, who had not received a Roman education, and rather despised it as tending, as they thought, to make youth weak and effeminate, remonstrated with the queen, saying that they wanted a warlike king and not a clerk; that Theodoric, who could not write, had governed his states with glory, and that instead of surrounding Athalaric with pedants he ought to keep company with young men of his age and exercise himself in manly sports. Amalasonta was obliged to give way, and the consequence was that Athalaric gave himself up to drinking and debauchery, of which he died, A.D. 534 or 535. Amalasonta named as her colleague Theodatus, a nephew of Theodoric, with the title of king. Theodatus had been guilty of extortion in Tuscany, for which he had been tried at Ravenna and condemned to refund his ill-acquired riches. But he was the last remnant of the family of Theodoric, and Amalasonta had no choice. He showed himself ungrateful, joined a party against Amalasonta, arrested her, and confined her in an island in the lake of Bolsena, where she was soon after strangled. Theodatus did not long enjoy the fruits of his guilt. Justinian, seeing a favourable opportunity for recovering Italy to the empire, ordered Belisarius to occupy Sicily, sent other troops to occupy Dalmatia, and concluded an alliance with the Franks against the Goths. Belisarius, having taken possession of Sicily, landed at Rhegium in Southern Italy, and advanced towards Naples. Theodatus at first made secret proposals to Justinian to give up the kingdom for a pension, but he afterwards altered his mind, and sent Vitiges, one of the veteran officers of Theodoric, into Campania to oppose Belisarius. The Gothic troops, who despised Theodatus, proclaimed Vitiges their king, A.D. 536. Theodatus was put to death, and Vitiges married Matasunta, daughter of Amalasonta, and was acknowledged king by the Goths.

In the mean time Belisarius attacked Naples, took it by surprise, and gave it up to indiscriminate plunder: he then advanced towards Rome. [BELISARIUS.] The Gothic garrison consisted of only 4000 men, and the citizens, alarmed at the fate of Naples, offered to surrender. The Gothic troops, unable to prevent this, evacuated the city, which Belisarius entered. He quickly set about repairing the walls, dug a ditch round, and made every preparation for defence. Vitiges, who was at Ravenna, collected a large army, with which he marched against Rome in the following year. The Goths battered the walls with engines in various places, but they could not, says Procopius, completely surround the city, owing to its vast circuit. They cut off the aqueducts and stopped the mills outside of the walls; but they allowed divine service to be performed as usual in the churches of St. Peter and St. Paul outside the gates. Scarcity being felt within Rome, Belisarius embarked the women, children, and other helpless persons on the Tiber, and sent them to Naples and Sicily, without any impediment being offered by the besiegers, as it appears. Belisarius committed an act of violence against Sylverius, bishop of Rome, whom he arrested on pretence of a conspiracy, stripped him of his episcopal robes, and banished him to Patara in Lycia. This was done at the desire of the empress Theodora, who favoured the patriarch of Constantinople, Anthemus, and others who had been condemned as heretics by Sylverius. Belisarius convoked the council of the clergy of Rome for the purpose of electing a new bishop, and suggested the deacon Vigilius, who had been intriguing at the court of Constantinople, as a proper person. This suggestion was equivalent to a command, and Vigilius was elected in November of that year. Such an act of violence had not been perpetrated before, although the Gothic kings were Arians. The siege of Rome still continued, and the citizens were afflicted both by famine and pestilence; but reinforcements being on their way to join Belisarius, Vitiges thought it prudent to conclude a truce. A supply of provisions came up the Tiber to Rome, together with a reinforcement of a few thousand men. In the following year, 538, Justinian ordered Sylverius to be sent back to Rome, and his case to undergo a fresh investigation. But Theodora and Vigilius prevailed upon Belisarius to banish him again to the island of Pontia, some say Palmaria, where he died of starvation in June of that year. Vigilius was now universally acknowledged bishop of Rome. A lieutenant of Belisarius having effected a diversion against the Goths in Picenum, and taken Ariminum and other places, Vitiges raised the siege of Rome, and moved to the north of Italy, where the war was carried on for some time longer. Milan, having revolted against the Goths, was retaken by Uraia, the nephew of Vitiges, and given up to indiscriminate pillage and slaughter A.D. 539. In the year 540, Vitiges, disheartened by the disaffection of his troops, surrendered himself at Ravenna to Belisarius, and was sent to Constantinople, where he was treated with considerable leniency. The Goths however chose another king in the person of Totila, a brave officer, who soon recovered the greater part Italy, while Belisarius was absent in the East. Rome and venna however remained in the possession of the imperial . In 545 Belisarius returned to Italy, but with an in- force. Totila laid siege to Rome, and in the fol- year entered it by the treachery of some Isaurian , who opened the Porta Asinaria to him in the . He exerted himself to save the inhabitants, of whom aratively few were killed by his soldiers. He then went isit St. Peter's church, where he was received by the on Pelagius, who pleaded the cause of his countrymen. a, having assembled the senate, reproached them with ingratitude for the protection and kindness that they experienced at the hands of Theodoric and Athalaric, whom they had deserted for the Greeks, who had treated hem much worse than the Goths. He however forgave lived with the Romans, so say Anastasius and r of the 'Historia Miscella,' 'as a father in the st his children.' Some reverses which his troops sus- d in Lucania inducing him to quit Rome, he partly de- ed the walls, but he spared the public buildings. along with him the senators and other principal he proceeded towards Campania; and Belisarius, ing Rome, immediately set about repairing the s as well as he could, in the expectation of Totila return- as he did in the following year, 547, but was repulsed e the city. In 548 Belisarius was again recalled, and in Totila laid siege to Rome, which he again entered gh the treachery of some Isaurian sentries, who opened Porta Capena. The Greek garrison were taken prisoners, except 400 men, who shut themselves up in the Mausoleum of Hadrian, determined to sell their lives dear; but Totila having offered them honourable terms, they accepted his conditions, and most of them entered his service. Totila recalled the senators and other principal citizens Campania, treated them kindly, and gave them the ment of the equestrian games. He fortified the oleum of Hadrian, and made a kind of citadel of it, as ity was too large to be effectually defended.

552 Narses was sent to Italy by Justinian. Totila nced from Rome to meet him, and a battle was fought at in Umbria, in which Totila was defeated and killed. o Theodoric, he was the bravest, ablest, and most of the Gothic kings of Italy. Narses entered Rome difficulty, and the garrison of the citadel surren- . The Goths now elected at Pavia one of their rals, named Teias, for their king. Teias collected an and marched to the south. The Roman hostages who en taken by Totila along with him, were put to death as, to the number of 300; but those Roman citizens had settled in Campania returned home, and Rome, h had become nearly deserted, began to fill again with bitants. Narses having attacked Cumæ, then a strong ess, in which Totila had placed his treasure, Teias hed to its relief. The two armies engaged near Nocera pania, and Teias fell in the battle. With him the kingdom of the Goths in Italy. [Narses.]

r the wise administration of Narses, Rome recovered the long calamities that it had suffered during the war. Narses, though not constantly resident in , often visited the city. Rome escaped the devastating sion of a large party of Franks and Alamanni, who Italy to its southern extremity, but were defeated slaughter by Narses on the banks of the river , after which Narses returned in triumph to with an immense booty. It appears however that the complained of the avarice of Narses to Justinus II., uccessor of Justinianus, and that this contributed to leposition of Narses from his governorship, in which he superseded by Longinus, who was named Exarch of The Romans seem to have felt some compunction ir ingratitude towards the veteran commander, who retired to Naples, and sent their bishop John to invite ack to Rome. Narses accepted the invitation, and quietly at Rome, A.D. 568, being then above ninety f age.

iod II.:—Rome under the Exarchs.—The Exarchs, fixed their residence at Ravenna, made a considerable change in the administration of Italy. The annual consulship, an institution which, though greatly shorn of its former honours and authority, had been perpetuated, at least in form, with some few interruptions, from the time of the antient republic, fell into disuse after the year 541. During the Gothic war, Basilius was the last consul appointed. Still it was customary at Rome, in Italy, and in the West in general, to date the years from the consulship of Basilius, junior, and this custom prevailed till nearly the end of the 6th century, as is proved by the epitaph of a noble matron called Cesaria, who died at Arles, A.D. 587, preserved by Baronius, in which it is said that she died in the forty-sixth year after the consulship of Basilius junior, and the twelfth of king Childebert. But the distribution and the names of the provinces had remained the same as under Constantine, and they were administered by consulares and præsides. Longinus however abolished these magistrates, and instead of them sent an officer called Dux to each town or district, who was changed every year. Rome was not in this respect more privileged than the rest; it had its duke, or patrician, as he is sometimes called, who was sent from Ravenna. Hence the name of Duchy of Rome, which is often mentioned in the chronicles, but the limits of which are not closely ascertained, and perhaps varied at different times in the dark ages. We find Amelia, Orta, Sutri, and Bleda mentioned as belonging to it. Rome however retained its internal municipal administration and laws, and the clergy and bishop of Rome began to exercise a greater influence in temporal matters than they had done under the Gothic kings. Every new bishop of Rome was elected by the joint votes of the clergy, the senate, and the people, but was not consecrated till he received the approbation of the Exarch, or, through him, of the Eastern emperor. [Papal State—*Modern History*.]

The Longobards occupied a great part of Italy, but they never took Rome, although they threatened and besieged it several times during the two centuries that their power lasted. This remarkable fact may be partly explained by the circumstance of Rome being doubly protected by the presence of her bishop, who was highly venerated in all the West, and by the temporal jurisdiction exercised over it by the Greek emperor. The Longobards never formed a compact kingdom; they did not possess all Italy, as the Goths had; the Eastern emperors retained a considerable part of the country, and their power, though distant, was still considered formidable. [Longobards.]

The Romans however did not always live on the best terms with the Byzantine Exarchs and their delegated dukes, for we read of several instances in which the dukes committed acts of violence against the clergy, and even against the bishop of Rome [Martin I.]; we read of revolts in Rome against the Exarch, sometimes encouraged by the Byzantine delegates; we, find in the year 638, the treasury of the Basilica, or church of the Lateran, broken into by the imperial garrison, and the contents partly used for the payment of the troops and partly remitted to the emperor at Constantinople, an act of violence which, Muratori observes, the Longobards never perpetrated in the countries subject to them. The removal of the treasures, it is said, took eight days. The emperor Constans II. visited Rome about A.D. 660, and was received with great honours by pope Vitalianus, but on his departure he took away a quantity of bronzes and other valuable ornaments, among the rest the bronze plates which covered the roof of the Pantheon. (Paulus Diaconus, v. 11.) Occasional disputes between the see of Rome and that of Constantinople, about points of dogma or discipline, served to alienate the Romans still more from their allegiance to the emperors. Lastly came, in the early part of the eighth century, the great schism of the Iconomachi, or Iconoclasts, which led to the total separation of Rome from the Eastern empire. [Leo. III., *Isauricus*.]

The people of Rome, those of Ravenna, of the Venetia, and of Italy in general, refused to obey the orders sent by the emperor Leo to remove the images from the churches Pope Gregory II. condemned the Iconomachi as heretics Leo, being irritated, laid a capitation tax upon his Italian subjects, but the pope opposed this measure. Duke Basilius, Marinus Spatharius, military commandant, Jordanus Carthularius, treasurer, and other imperial officers at Rome, conspired against the life of the pope, being encouraged, it is said, by the Exarch Paulus; but the people of Rome rose in defence of their pontiff, killed Jordanus and another of the conspirators, and obliged Basilius to become a monk in order to save his life. The Exarch sent troops from Ravenna against Rome, but they were met on their way by the Longobards of the duchy of Spoleto, and obliged to retire. Luitprand, king of the Longobards, thought of availing himself of these dissensions to extend his own dominion and drive the Byzantines from Italy, and he took the part of the pope. The pope however does not seem, as Theophanes (*Byzant. Hist.*) has insinuated, to have encouraged any open revolt against the emperor, and he is said even to have prevented the imperial troops, which were stationed at Ravenna and in the Venetia, from proclaiming another emperor. (Paulus Diaconus, vi. 49.) Luitprand however besieged Ravenna, and took it, but it was soon after retaken by the Byzantines, with the assistance of a Venetian squadron (A.D. 729). Peace being concluded between Luitprand and the Exarch Eutychius, they both proceeded to Rome, in order to restore that city and duchy, which were in a state of revolt, to the imperial allegiance, which was effected without much opposition, the pope acting as mediator.

Gregory III., who succeeded Gregory II. in 731, continued to maintain the use of images, in opposition to the emperor, who seems not to have had the means of enforcing his orders in Italy, as he had done in the East. The dispute therefore became merely one of words, and Rome remained quiet, and owned, at least nominally, the emperor as her sovereign. About the year 739, Trasimund, duke of Spoleto, having revolted against king Luitprand, the latter marched to Spoleto, and Trasimund escaped to Rome. Luitprand demanded the person of the fugitive, but the pope and the imperial governor, according to Anastasius, in his 'Historia Ecclesiastica,' refused to give him up, and, some time after, Trasimund, with the assistance of the duke of Benevento and of the Romans, recovered his duchy. This brought on a rupture between Luitprand and the Romans, and the devastation by the Longobards of part of the Roman duchy, which induced pope Gregory to think of applying for support to Charles Martel, whose fame was great in the West, especially after his defeat of the Saracens at Poictiers. Gregory sent an embassy to Charles Martel, about the year 740, with presents and the keys of the sepulchre of St. Peter, and with an offer of transferring the allegiance of the duchy of Rome from the emperor to him, provided Charles would protect Rome against the Longobards. It does not appear that Charles interfered actively in this business, but he sent an embassy to the pope with rich presents. This however was the beginning of the connection of the popes with the kings of France. On the death of Gregory, his successor, Zacharias, adopted a different course of policy, and, instead of applying for assistance from beyond the Alps, sent an embassy to king Luitprand, to beg of him to let the duchy of Rome have peace, and to propose at the same time to unite the forces of the Romans with his against the duke of Spoleto. It appears that the citizens of Rome, independently of the imperial garrison sent from Ravenna, had their own militia, which must have been of some importance, as we hear repeatedly of its acting in the field, either against or with both Longobards and Greeks. Much confusion however arises through Paulus Diaconus and other old chroniclers applying indiscriminately the word Romans to all the subjects of the emperor in Italy, as well as to his soldiers, for the Eastern empire was still called Roman. Thus we hear of the Romans defeating the soldiers of Luitprand near Ariminum and Fanum, which probably refers to the imperial troops under the exarchs of Ravenna. Luitprand accepted the offer of Zacharias, and the united Longobard and Roman forces compelled Trasimund to submit. Luitprand obliged him to take clerical orders, and appointed his nephew duke of Spoleto.

Pope Zacharias had an interview with Luitprand at Orta, when the king received him with great honours, and restored all the prisoners made in the preceding war, not only those belonging to the duchy of Rome, but also those belonging to Ravenna and its territory. At the same time Luitprand restored several towns and domains belonging to the duchy of Rome, which he had occupied, but he gave them in writing as a donation to St. Peter, and not to the duchy or the empire. The duke of Chiusi and other personages of his court were sent to escort the pope back to Rome.

In the following year, 742, the Exarch of Ravenna, with whom Luitprand was still at war, unable to resist the Longobards, appealed to the pope to mediate between them, and Zacharias repaired with some difficulty to Pavia, where he prevailed on Luitprand to make a truce with the Exarch, and to restore some districts belonging to Ravenna, and two-thirds of the territory of Cesena; the king was to retain the other third until the return of the ambassadors whom he had sent to Constantinople.

Luitprand died about 743. He was one of the ablest [illegible] wisest kings that the Longobards ever had. His [illegible] Ratchis, at the recommendation of the pope, concl[illegible] 744, a truce of twenty years with the Eastern emperor. [illegible] years afterwards however Ratchis, for reasons which [illegible] not known, broke the truce, invaded the Pentapolis, [illegible] besieged Perusia. Zacharias with part of his clergy [illegible] paired to his camp, and there prevailed on the king to [illegible] peace. Soon after Ratchis abdicated the crown, and [illegible] to Monte Cassino, where he became a [illegible]nk. His [illegible] Astolphus succeeded him, and peace wa[illegible] int[illegible] as Pope Zacharias lived. His su[illegible] either not so conciliating or not so successful, [illegible] his accession (A.D. 753, according to others 752). [illegible] out again in Italy, Astolphus became master of [illegible] and threatened Rome, demanding her submiss[illegible] capitation tax from all the inhabitants of the duchy. [illegible] some fruitless negociations, Pope Stephen repaired with John Silentiarius, an imperial commissioner, but [illegible] phus was deaf to their remonstrances. The [illegible] to France, where he crowned Pepin, the [illegible] Martel, king, declaring him and his two so[illegible] Carloman patricians of Rome. [PEPIN LE [illegible] Stephen at the same time pleaded [illegible] against the Longobards, and it was resolved [illegible] the Frankish nobles to make war against Astolphus. [illegible] entered Italy with a large army, and Astolphus shut [illegible] up in Pavia. After a short siege, a treaty was con[illegible] by which Astolphus promised to leave Rome in [illegible] to restore the towns of the duchy which he had s[illegible] whose forces were led by turbulent nobles, was [illegible] cross the Alps, and Astolphus broke his [illegible] the year 755 he besieged Rome and de[illegible] The pope despatched by sea messengers [illegible] letter addressed to Pepin, his sons, and the [illegible] nation, requesting them in the name of St. [illegible] Rome and the church. Pepin again crossed [illegible] Astolphus retired to Pavia, and soon after concluded [illegible] treaty, by which he engaged to pay a large sum of [illegible] and not only to restore all that belonged to the [illegible] Rome, but also Ravenna and the Exarchate to the [illegible] St Peter. In the mean time Constantine, [illegible] East, had sent ambassadors to the Franks, [illegible] at Marseille, were surprised and grieved to [illegible] that [illegible] had already crossed the Alps. One of them, called [illegible] overtook Pepin near Pavia, and urged the restor[illegible] Exarchate to his master. Pepin replied that he [illegible] given it to St. Peter, and dismissed the ambassador. [illegible] of donation of the Exarchate, the Pentapolis, and [illegible] of Comacchio was made by Pepin. [PAPAL STATE[illegible] following year, 757, Astolphus died, and Desideri[illegible] Istria, was proclaimed king of the Longobards. [illegible] refused to observe the stipulations of Astolphus, and [illegible] several towns of the Exarchate: he also refused to [illegible] the domains of the church situated in his [illegible] went by the name of 'Justitiæ beati Petri.' [illegible] however was entered into between Desiderius and [illegible] about the year 760, and a letter of thanks was sent to [illegible] in the name of the senate and the people of Rome for [illegible] effectual protection.

In the year 767, after the death of Pope Paul I., a [illegible] graceful scene took place in Rome. Toto, duke or governor of Nepi, entering Rome with a body [illegible] several bishops to ordain and consecrate [illegible] stantine, a layman, and he put him in possession of [illegible] teran. Others of the clergy escaped, and ap[illegible] Longobard duke of Spoleto, who in the next y[illegible] sent a party of armed men, who defeated and killed [illegible] clergy then elected Stephen IV., and the mob tore [illegible] Constantine and his adherents.

In the year 768 Pepin died, and was succeeded by [illegible] sons, Charlemagne and Carloman, but [illegible] latter after dying, Charlemagne remained sole ki[illegible] Frank monarchy. A fresh quarrel broke out [illegible] and Pope Adrian I., and Desiderius advanced [illegible] as far as Otriculum. The pope sent three with excommunication if he violated the territory of the y of Rome, and Desiderius returned to Pavia. Adrian ipplied for assistance to Charlemagne, who passed the and besieged Desiderius within Pavia. Desiderius ndered in 774, and the kingdom of Italy passed under ominion of the Franks.

riod III.:—Rome under the Emperors of the Carlo- ian Dynasty, A.D. 774-888.—Charlemagne, having ned the iron crown of Lombardy, confirmed Pepin's tion to the pope, who acknowledged him as patri- of Rome and his temporal superior. In the year the sovereignty of Charlemagne over Rome was rmed by Pope Leo III., who crowned him at Rome ror of the West, with the title of Carolus I., Cæsar ustus, a title which was acknowledged by Nicephorus, ror of the East, who defined the limits between the two res. [CHARLEMAGNE.] Those limits in Italy were the boundary between the Longobard duchy of Benevento the Byzantine provinces of Apulia and Magna Græcia. e and Ravenna were included within the limits of the Western empire, of which Rome was still the nominal al. From that time the popes assumed a temporal au- ty over the city and duchy of Rome, subordinate how- to the emperor of the West as their suzerain; and they n to coin money with the name of the pope on one side hat of the emperor on the other. The pope was in fact at vassal of the empire, but his authority was also ed by that of the senate and the general assemblies of eople and clergy. The name of Roman republic was occasionally revived. Like other great vassals, the s made subinfeudations to numerous nobles or barons in luchy of Rome and the Romagna. [ROMAGNA.] The d of the Carlovingian supremacy was upon the whole perous for Rome. The Western emperors made ample tions to the papal see, and the papacy being the highest t of ambition in those times, and the fountain-head of cal dignities, Rome became the resort of numerous ap- nts, and again assumed the appearance and bustle of a t capital. But the public peace was often disturbed at e by factions, especially among the clergy, in which how- the lay population took an active part. Instances of violence and atrocities committed on those occasions are n under LEO III.

nder Louis the Pious, successor of Charlemagne, Lo- ius, his colleague in the empire, came to Rome for the ess purpose of reforming many abuses. In doing this cted in concert with Pope Eugenius II. He restored h property to its lawful owners, which had been unjustly opriated by the papal fiscus under the preceding pope, chal I., who was also accused of having caused several of clergy to be put to death without a regular trial; he dis- ed and banished those Roman judges who had been ty of great extortion, and in lieu of them he appointed es 'ex latere imperatoris,' who were to hold office as as the emperor should think proper. Lotharius e several constitutions regulating the privileges of city and duchy of Rome, and also calculated to pre- t the disorder, violence, and robberies which generally place during the election of a new pope. Imperial i, or commissioners, were directed to be sent every year ear complaints against the judges, dukes, and officers of government, and report first to the pope, who was to justice done and then report to the emperor. They were to ask the senate and people of Rome by what laws would be judged, whether by the Roman, the Longo- l, the Salic, or the Ripuarian, which were all in force in y at the time, owing to the admixture of various nations had settled in the country. Several nobles having ta- possession of church property on the pretence that it given to them by former popes, Lotharius ordered its ediate restitution. Lastly, and this is not the least ious feature of the times. Lotharius enjoined the inha- nts of the duchy of Rome from committing depredations the borders of the neighbouring provinces of the king- of Italy. Lotharius called into his presence the es, judges, and other magistrates who were in Rome, and istered their names and offices; he instructed them on r duties, and enjoined them to pay proper respect to the e, if they valued the favour of the emperor. According he continuator of Paulus Diaconus, Lotharius, before he Rome, required of the clergy and people a solemn oath delity to Ludovicus and Lotharius, emperors, in which was also a protest against any future election of a pope which should not be according to the canonical forms, and a promise not to cause the pope elect to be consecrated until he had taken the oath of fidelity to the imperial commissioner. All these reforms, promises, and protestations were however forgotten during the subsequent weakness and decline of the Carlovingian dynasty, and the old system of misrule prevailed at Rome more than ever.

Louis II., son of Lotharius, being appointed by his father king of Italy about the year 844, repaired to Rome, where he was crowned, whilst the French soldiers whom he had brought along with him remained outside of the walls plundering the country. In the following year an armament of Saracens or Moors came to the coast of Rome, ascended the Tiber, and plundered the churches of St. Peter and of St. Paul outside of the walls. It was in consequence of this that Pope Leo IV. determined to enclose the Vatican Basilica and its adjoining suburb by a wall; and Lotharius and his brothers sent money for the purpose, besides which a tax was laid on the duchy of Rome. The line took four years to complete it. Under the year 856 is registered a dreadful inundation of the Tiber, followed by a pestilence which destroyed a great part of the inhabitants of Rome.

Louis II., son of Lotharius, who had assumed the imperial crown, as well as that of Italy, after the death of his father, and who must not be confounded with his cousin Louis II. of France, called 'Le Begue,' or the stammerer, son of Charles the Bald, and grandson of Louis the Pious [LOUIS II. of France], resided in Italy, continually waging war against his great vassals, the dukes of Spoleto and Benevento, and also against the Greeks and the Saracens. He was a good-natured and well-intentioned but weak prince. Under his reign the usual disturbances took place at Rome during the elections of new popes.

Adrian II. being elected pope in 867, without the knowledge of the imperial commissioners, who protested against his consecration, Lambert, duke of Spoleto, entered Rome with a party of soldiers, and, upon the pretence that the people were rebels against the emperor, he plundered the town, broke into churches and monasteries, and carried off many young women. Lambert however was punished by the emperor, being deprived of his duchy, and the election of Adrian was confirmed. Adrian was married before he took priest's orders, and his wife Stephania was still living separate from her husband with a daughter, who was betrothed to a noble Roman. Eleutherius, brother of Anastasius, rector of S. Marcellus, and bibliothecarius of the Roman see, carried off the girl and married her clandestinely. It seems that the pope undertook to separate them, when Eleutherius, a violent man, went to Stephania's house and killed both mother and daughter. Adrian demanded a trial of the murderer by the imperial commissioners: Eleutherius was condemned to death, and his brother Anastasius was excommunicated by a council.

The emperor Louis II. died A.D. 875, and his succession was disputed between Louis, king of Germany, and his brother Charles the Bald, king of France. A period of confusion followed, in which the imperial authority in Italy became almost extinct. Charles was proclaimed emperor, but died soon after, A.D. 877; then Carloman, son of Louis of Germany, caused himself to be proclaimed king of Italy by the nobles of Lombardy; and lastly, after his death, Charles the Fat, Carloman's brother, was crowned emperor at Rome, by Pope John VIII., A.D. 880. In 885, after the death of Pope Adrian III., the territory of Rome was ravaged by swarms of locusts from Africa. Stephen V., Adrian's successor, found the people famishing, the granaries empty, and the Lateran palace and the Basilicæ stripped of their treasures in the interregnum between the late pope's death and the installation of his successor. The new pope sold his patrimonial property to relieve the poor. He ordered holy water to be sprinkled over the country in order to destroy the locusts, but finding this insufficient, he promised a reward for every measure of dead locusts brought in by the peasants.

In the year 887 Charles the Fat was solemnly deposed as unworthy of the crown, and in him ended the imperial dynasty of the Carlovingians. Arnulfus, a natural son of Carloman, was elected in Germany; Eudes, count of Paris, was proclaimed in France; and Berengarius, duke of Friuli, of Frankish race, was elected king of Italy by the nobles.

Period IV.:—Rome during the disputed succession to the kingdom of Italy, 888-961.—Berengarius had for a competitor Guy, duke of Spoleto, who collected a large force and defeated Berengarius on the banks of the Trebbia. Guy was crowned king of Italy, at Pavia, by a council of bishops, and afterwards repaired to Rome, where he was crowned emperor by pope Stephen VI., in February, 891. Pope Stephen soon died, and a double election followed, one part of the clergy and people of Rome choosing a deacon named Sergius, and another electing Formosus, bishop of Porto. Formosus remained master of the field, and Sergius fled to Tuscany. In 894 Arnulfus came to Italy from Germany with a large army, being invited both by pope Formosus and by Berengarius. He took Brescia and Bergamo, the latter by storm · his German soldiers committed the greatest atrocities, which so frightened the other towns of Lombardy, that they opened their gates. On the death of Guy, his son Lambert remained to dispute the crown against both Berengarius and Arnulf. In 895 Arnulf repaired to Rome, drove away the partizans of Lambert, who had occupied the Leonine or Vatican suburb, and was received at the Milvian bridge with great honour by pope Formosus and the Roman senate. He was crowned emperor by Formosus, and received the oath of allegiance of the city of Rome. Retreating to the north, he crossed the Alps into Germany, his troops being harassed on their march by the revolted population of Lombardy. The history of Italy during the latter part of the ninth and the first part of the tenth centuries is extremely obscure and confused, and it is hardly possible to ascertain dates and facts accurately. In the year 897, pope Stephen VII, who had disinterred the body of his predecessor Formosus, and thrown it into the Tiber, was seized by the revolted Romans, cast into prison, and strangled. [FORMOSUS.] John IX., in a council held at Rome, annulled the election of Arnulf, and confirmed that of Lambert as lawful emperor. In the same council it was again decreed that no pope elect should be consecrated without the Imperial sanction; and it was likewise forbidden, under pain of canonical censure, and of the Imperial displeasure, to strip the pontifical palace at the death of a pope, a practice which was become customary on the part of the relatives of the deceased, not only in Rome, but in other Italian sees.

Pope John then proceeded to Ravenna, where he met Lambert, and held another council of seventy-four bishops, in which, among other things, it was decreed that every Roman should be at liberty to appeal to the Imperial court. Lambert, on his part, confirmed the pope in the possession of the lordship of Rome, the Exarchate, and the Pentapolis. In the following year Lambert was killed while hunting, and Berengarius was acknowledged by most towns as sovereign of Italy

In the year 899 the Hungarians entered Northern Italy, committed dreadful ravages, and defeated Berengarius. In the same year Ludovic, or Louis, king of Provence, came into Italy, was proclaimed king at Pavia, and in the following year was crowned emperor at Rome by Benedict IV., where he also administered justice to those who resorted to him.

In the year 902 Berengarius re-appeared in the field, defeated Ludovic at Verona, and took him prisoner, but allowed him to return to Provence. After the death of Benedict IV., at Rome, the usual disorders took place on the election of his successor Leo V., who, after two months, was deposed and imprisoned by Christopher, his chaplain, who, in 904, was also driven away by another faction, and Sergius III. was elected pope. Sergius completely restored the Basilica of the Lateran, which had fallen to ruin. The Saracens from Sicily were now devastating Southern Italy; the Spanish Moors, having formed a settlement at Frassineto on the coast of Liguria, overran the neighbouring valleys of Piedmont; and the Hungarians also crossed the Alps to devastate the plains of Lombardy. It was then that Berengarius permitted the towns to fortify themselves with walls, ramparts, and ditches. At Rome, Theodora, a woman of loose character, and her daughter Marozia, wife of Alberic, patrician, were exercising considerable influence in municipal and also in ecclesiastical affairs, and they brought about the election of John X., said to be Theodora's lover. [JOHN X.] This pope crowned Berengarius emperor in the Vatican, with great pomp, A.D. 916. About the same time the Saracens were completely routed and destroyed on the banks of the Liris, by the united troops of Berengarius, and of the dukes of Benevento, of Naples, and of Gaëta.

In the year 921 several Italian nobles and the archbishop of Milan conspired against Berengarius, and called to the throne Rudolf II., king of Burgundy. After much fighting, Berengarius was assassinated at Verona, in March, [illegible] He was by all accounts a good, just, and humane prince [illegible] an age of barbarism. Hugh, duke of Provence, being c[illegible] by a strong party, came into Italy, drove away Rudolf, [illegible] was crowned king at Milan, A.D. 926. During this perio[illegible] confusion Rome was left to itself and its factions. Mar[illegible] and her second husband, Guy, duke of Tuscany, suppo[illegible] by armed partisans, and having possession of the castle of St. Angelo, ruled by force. The pope, John X., who had already quarrelled with the marquis Alberic, Marozia's first husband, was also in opposition to Guy. A party of Marozia's satellites entered the Lateran palace, murdered Peter, the pope's brother, and dragged the pope to a dungeon, where he soon after died; it was said that he was smothered His successor Leo VI. died in a few months, and he [illegible] was murdered, according to report. Of Leo's s[illegible] Stephen VII., nothing is known. To Stephen succe[illegible] John XI., son of Marozia. Duke Guy being [illegible] dead. [illegible] brother Lambert succeeded him as duke of [illegible] : king Hugh, his half-brother, being jealous of [illegible] him, deprived him of his sight, and substituted [illegible] Boson in the duchy. Hugh, who wished to have [illegible] his possession and to be crowned emperor, propose[illegible] marry Marozia, who accepted the offer. Hugh came [illegible] Rome, A.D 931, was received by his bride in the castle [illegible] Angelo, having left his armed bands outside of the [illegible] He is said, by Luitprand, to have behaved insolently t[illegible] the Roman nobles, and to have given a blow in the [illegible] Alberic, Marozia's son, while the latter, by his [illegible] desire, was handing him a ewer and basin to [illegible] hands. Alberic conspired with the nobles against [illegible] and besieged him in the castle, from which Hugh esca[illegible] by being lowered down the wall by a rope, and repai[illegible] his camp, quitted the duchy of Rome. Alberic place[illegible] mother in confinement, and let his half-brother John [illegible] attend to his duties as pope, but he allowed him no shar[illegible] temporal power, and watched him closely.

Alberic assumed the title of prince and senator of al[illegible] Romans, 'Dei gratia humilis princeps atque [illegible] manorum senator.' It is conjectured by s[illegible] senate of Rome consisted at that time of a cert[illegible] of counts, each of whom presided over a region, and the 'princeps senatus,' or president, was also the head [illegible] gistrate of the whole city. (Conrigius Curtius, *De S[illegible] Romano post Tempus Reipublicæ Liberæ.*) Albe[illegible] money in his name, with the legend 'Albericus [illegible] governed Rome till his death, which happened abo[illegible] year 954, and he appears to have administered it [illegible] reformed many abuses, and above all checked [illegible] tiousness of the clergy and convents. King H[illegible] marched against Rome, and devastated its territor[illegible] could not enter the city. At last Hugh, thr[illegible] tyranny and debauchery, became odious to the Ital[illegible] called to their deliverance Berengarius, [illegible] who had taken refuge in Germany. Bere[illegible] with some troops, and entered Milan, where [illegible] nobles and prelates joined him. Hugh, who ha[illegible] Pavia, sent his son Lotharius to Milan, prop[illegible] the crown to that youth. The modest d[illegible] of [illegible] tharius so pleased the assembled people, that they [illegible] mously proclaimed him king, but Berengarius exer[illegible] the authority in his name, A.D. 946. Hugh retu[illegible] Provence, where he died. In the year 949 or 950 Lo[illegible] died, not without suspicion of poison administered [illegible] rengarius, who was proclaimed king, with his son Ad[illegible] as his colleague, and both where crowned at Pavia. [illegible] garius wished his son to marry Adelaide, the widow of [illegible] tharius, who was only twenty years of age and on her ref[illegible] he shut her up in prison. Her sufferings have been [illegible] in Latin verse by a contemporary nun called [illegible] priest found access to Adelaide's prison, and le[illegible] disguise to Adhelard, bishop of Reggio, who [illegible] charge to Azzo, lord of Canossa, the great-gr[illegible] ther the famous Countess Matilda. Otho of Saxony, an[illegible] Germans, being informed of all this, came to Italy [illegible] armed force, in the year 951, defeated Berengarius, married Adelaide at Pavia, and in the following year [illegible] turned to Germany. He however allowed Berengarius [illegible] retain the crown of Italy as his vassal, after swearing fid[illegible] to Otho in the presence of the court and army, excep[illegible] Friuli and the March of Treviso, which were kept by [illegible] under his immediate dominion. Otho h[illegible] to Berengarius a sceptre of gold, [illegible] action arose the claims of the kings of Ger- [illegible] the kingdom of Italy. Berengarius however [illegible] forgo[illegible] lesson that he had received: he laid siege to [illegible]ossa, intending to revenge himself upon Azzo, but Otho came again from Germany, defeated and deposed Berengarius, and was himself elected king of Italy, and crowned in the church of S. Ambrose at Milan, with the antient crown and other insignia of the Longobard kings. [OTHO I.]

Meantime, prince Alberic having died at Rome, his son Octavianus, a mere youth, assumed the title of prince of Rome, and on the death of pope Agapetus II., A.D. 956, he was also elected pope, by the name of John XII. He was the first who changed his name on being made pope. Whilst Rome and its duchy had become in fact independent of the kingdom of Italy, the kings of Italy, on their side, had taken possession of the Exarchate, and Adalbert, son and colleague of Berengarius, had his residence at Ravenna, till he was deposed by Otho.

Period V.:—Rome under allegiance, real or nominal, to the kings of Germany and of Italy, 961-1278.—Otho, after his coronation at Milan, repaired to Rome, where pope [illegible]n XII. crowned him emperor. He swore to respect the [illegible]ty of the Roman see, and not to encroach upon its [illegible]al rights and possessions. He was acknowledged [illegible]ror, and his son as king of the Romans, but the pope [illegible]d lord of the Roman duchy as a great imperial [illegible]ry, as in the time of the Carlovingians. It has been [illegible]ed by some writers that the imperial dignity was thus [illegible]d to the French kings, as the name of Francia was [illegible] also to Germany, and Constantine Porphyro[illegible] (*De Administrando Imperio*) calls Otho king of [illegible]ny and Francia.

[illegible] the year 963 Otho returned to Rome, being called [illegible]re by numerous complains against pope John, who, it [illegible], had transformed the Lateran Palace into a [illegible] and also by information which he received of [illegible]s between the pope and Adalbert, son of Berengarius, w[illegible] had still a party in Italy. John escaped, and [illegible] led a c[illegible]ncil in the Vatican, which, having [illegible] s[illegible]inst John, deposed him, and elected [illegible] VIII [illegible]gy, senate, and other orders, styled [illegible]avitatis, sanctioned his deposition, and [illegible] in future to elect a pope without the [illegible]eror's consent. In the following year, after Otho's de[illegible]re from Rome, John re-entered the town, called [illegible]r another council, which declared the election of [illegible]II. unlawful, and put to death or mutilated many of [illegible]se who had taken part in the former council: 'Multa [illegible] primorum in urbe debacchatus,' are the words of the [illegible]nicler Gerbert [JOHN XII.] Upon hearing this, Otho [illegible]d [illegible], but pope John dying, his faction [illegible] Leo remained with the emperor. [illegible] besieged R[illegible] reduced it by famine. Bene[illegible]osed, and [illegible] Germany, and Leo was rein[illegible] and [illegible]owever died soon after, and [illegible] the [illegible] Speyer and of Cremona as [illegible] to be present at the election, John, bishop [illegible], was elected by the clergy and people, A.D. 965. [illegible]led XIII., however, having incurred the dislike of [illegible] by his haughtiness and harshness, was seized by [illegible]t of Rome, and taken prisoner to a castle in Cam[illegible], where he remained ten months, after which, through [illegible] of Otho, he was liberated and restored to Rome. Otho [illegible] to Rome, and hanged thirteen of the principal people, [illegible] by some, tribunes, who had taken part in those pro[illegible]; the præfect however escaped.

[illegible] remained tolerably quiet during the remainder of [illegible] reign: but after his death, A.D. 973, it again fell a [illegible] to disorder. A faction, at the head of which were [illegible]dinal called Francone and a certain Crescentius, [illegible]pe Benedict VI., and strangled him. Francone [illegible]ossession of the papal chair, but he was soon driven [illegible] though not before he had plundered the Vatican [illegible] Benedict VII. was then elected with the appro[illegible] Otho II., A.D. 974. Nothing particular seems to [illegible] occurred at Rome till Otho II.'s death, which took [illegible]hat city in the year 983.

[illegible]g the long minority of Otho III. there was anarchy [illegible]. Cardinal Francone, who styled himself Boniface [illegible] returned to Rome, put to death pope John [illegible]m usurped the papal chair; but he died sud[illegible] year 985, and his body was dragged through [illegible] by the populace. John XV. was elected his successor, but Crescentius, who is styled senator of Rome, probably the chief senator, and by others consul, quarrelled with the pope, took possession of Hadrian's mausoleum, and obliged John to run away. Crescentius however soon after recalled him, and went with the senate in a body to ask his forgiveness. The chronicler Romualdus of Salerno says that the nobles, 'Romani Capitanei,' had usurped the authority in Rome. In the year 989 the empress regent Theophania, young Otho's mother, came to Italy, and visited Rome, from whence she issued several placita and diplomas. We are told that there were at that time within Rome no less than 40 convents of men and 20 of nuns, chiefly Benedictines, besides a vast number of regular canons.

In the year 996 Otho III. came to Ravenna with a numerous army. Pope John XVI. having died about that time, Otho sent to Rome his relative Bruno with the archbishop of Mainz and the bishop of Utrecht, and the Romans elected Bruno by the name of Gregory V. Otho was crowned emperor at Rome. He cited before him Crescentius for his conduct to the late pope John, condemned him to exile, but forgave him at the intercession of the actual pope. But after Otho's departure, Crescentius quarrelled with the new pope, and drove him out of Rome. Gregory repaired to Pavia, where he assembled a council, and excommunicated Crescentius. Crescentius however kept up a correspondence with the Byzantine court, and his design was to place the duchy of Rome again under the allegiance of the Eastern empire. He arrested the legates of Gregory, and caused John, bishop of Piacenza, a Greek by birth, to be elected pope, but he was generally considered as an intruder. In the year 998 Otho came to Italy, and having collected an army, he marched to Rome, taking with him pope Gregory. The Romans in alarm seized the anti pope John, pulled out his eyes, cut off his nose and tongue, and threw him into a dungeon. When the emperor entered Rome, he was entreated by a certain holy abbot called Nilus to give up to him the person of that unfortunate man, and the emperor was inclined to release him, but pope Gregory insisted upon his being dragged ignominiously through the whole town, for which Nilus threatened him with the vengeance of God. Crescentius, who had shut himself up in the castle of S. Angelo, was taken, but some say that he capitulated; he and twelve of his partisans were beheaded by order of the emperor, and their bodies hung on the castle battlements. In the following year pope Gregory died, and Gerbert, archbishop of Ravenna, who had been Otho's preceptor, was chosen pope by the name of Sylvester II. In the year 1001 a quarrel broke out between the Romans and the people of Tibur, which was the beginning of a long and bitter animosity between the two cities. The emperor took the part of the Romans, and Tibur was besieged and obliged to surrender. In the following year Otho died of fever at Paterno in the territory of Perugia. The story of his having been poisoned by the widow of Crescentius does not seem authentic.

The line of Otho the Great, to whom the Italians had sworn allegiance, having become extinct with Otho III., the Italians considered themselves at liberty to elect another king, and they chose Hardouin, or Hardwig, marquis of Ivrea, who was crowned at Pavia, in February, 1002. Hardouin was violent and overbearing; he maltreated several nobles and bishops, who applied to Henry II., king of Germany, offering him the crown of Italy. Henry came in 1004, by way of Trent; but finding the 'Chiuse' or defile of the Adige well guarded by Hardouin's forces, he followed another route by the sources of the Brenta, and arriving at Verona, was received by the great feudatories of Italy, who had mostly forsaken Hardouin. He was crowned at Pavia. Unfortunately a quarrel broke out between the Italians and the German troops, much blood was spilt, and part of Pavia was burnt. Henry soon after returned to Germany, and Hardouin recovered Pavia and part of Lombardy, but Milan, Piacenza, Cremona, and other towns remained faithful to Henry, and the two parties continued at war for several years. This was the origin of the great rivalry between the Lombard cities, and especially between Milan and Pavia. At Rome, pope Sergius IV. having died in 1012, Benedict VIII. was chosen for his successor; but another party elected a certain Gregory, who obliged Benedict to leave Rome and to take refuge at king Henry's court in Germany. In 1013 Henry came to Italy with his wife Cunegunda and a large army, and all Italy submitted to him. He then proceeded to Rome, where pope Benedict anointed and crowned him in 1014. The chronicler Ditmar says that twelve senators, six of whom wore their beards and the other six were shaven, escorted the emperor to church with wands in their hands. At the gate of the Vatican Basilica, Henry was asked whether he would be the defender of the Roman church, to which he replied in the affirmative. An affray however took place between the populace of Rome and the German soldiers, excited, it is said, by John, the son of Crescentius, in which many were killed. Henry returned to the North, Hardouin having withdrawn to a convent, where he died.

In Rome all civil affairs were decided by the senate, but the more important political questions were referred to the pope or his vicar, and to the emperor, or his vicar the prefect of the city (the office having been restored by Otho I.), who acted also as supreme judge in criminal matters, having received the investiture of the sword from the emperor for that purpose.

Conrad II. of Germany, Henry's successor, was crowned king at Milan and emperor at Rome in 1027. On this occasion another affray took place between the Romans and the German soldiers, and many were killed on both sides. The Romans however were obliged on the following day to send to the emperor to beg his pardon: the members of the deputation were barefooted, the freemen with swords hanging at their neck, the serfs with halters. Conrad forgave them. In 1038 Conrad came again to Rome to restore pope Benedict IX., who had been driven away by a faction.

Henry III., Conrad's successor in Germany, was acknowledged king of Italy, but did not come to be crowned in the latter country for some years. In the mean time pope Benedict IX. had become so odious through his misconduct, and the robberies and cruelties committed by his adherents, that the people of Rome drove him away, and elected for his successor John, bishop of Sabina, who styled himself Sylvester III. After six months Benedict returned with a strong support, and expelled his rival. But continuing in his evil courses, and seeing the general indignation roused against him, he sold the papal chair to John, or Gratianus, who assumed the name of Gregory VI., A.D. 1044. [BENEDICT IX.] Gregory, who is reckoned among the lawful popes, found Rome, on his accession, in a deplorable state. The property of the see of Rome had been plundered and alienated, so that he had hardly enough left for mere subsistence; the roads were infested by robbers, and no one could travel to Rome except with a large armed party, and the offerings made to the churches were seized by the factions. Gregory, after trying exhortations and excommunications without any effect, collected a force of both foot and horse, with which he hunted down the robbers. The people of Rome, accustomed to anarchy, called the pope a sanguinary man, and unfit to celebrate the sacred offices. At last Henry III. came to Italy in 1047, was crowned at Milan, and then proceeding southwards, arrived at Sutri, where he convoked a council, to which Gregory VI. was invited. There were then no less than three popes; Benedict IX., Sylvester II., and Gregory VI. The council deposed them all, and Gregory VI., on rising from his chair, laid aside of his own accord the pontifical robes. Henry entered Rome, and the clergy and the fathers of the council chose Suidger, bishop of Bamberg, who assumed the name of Clement II., and was consecrated on Christmas day: at the same time Henry was proclaimed emperor, after which great feasts were given in the Lateran palace. During the remainder of Henry's reign Rome enjoyed comparative tranquillity. His son, Henry IV., yet an infant, succeeded his father in 1056, under the guardianship of his mother Agnes. His minority was a troubled period for Rome. After the death of pope Stephen IX., in 1058, John, bishop of Velletri, an illiterate man, was tumultuously elected by the name of Benedict X. Pietro Damiano, bishop of Ostia, and other cardinals, protested against the election as illegal, but they were obliged to run away for their lives. The empress Agnes sent to Italy the monk Hildebrand, whose reputation for learning and piety stood very high, charging him to act in concert with Godfrey, duke of Tuscany, in order to adjust the controversy. A council was held at Siena, in which Gherardus, bishop of Florence, was elected pope under the name of Nicholas II. In the following year Nicholas proceeded to Rome, and Benedict of his own accord resigned his claim. Shortly after began at Milan the schism concerning the marriage of the clergy; those of Milan followed the example of the Eastern church, which does not require celibacy of its presbyters. A deacon of the name of Arialdus formed a party against the married clergy, and excited the people against them. Guido, archbishop of Milan, favoured the married priests, and excommunicated Arialdus. Nicholas sent two legates to Milan, who induced the archbishop to desist, and the marriage of the priests was forbidden. But this arrangement was only precarious, and the schism lasted much longer. Arnulphus and Landulphus Senior have given an account of this famous controversy. (Muratori, *Rer. Ital. Scriptores*, vol. iv.) In 1059 pope Nicholas issued a decree limiting the right of election to the cardinals, leaving however to the rest of the clergy of Rome the right of approving of the election. For the origin of and alterations effected in this institution see CARDINAL.

Nicholas died in 1061, and much contention arose about the election of a successor. One party, with Hildebrand at their head, contended for a free election, without waiting for the emperor's consent; another party sent to Germany to ask Henry's approbation. At last Hildebrand prevailed, and Anselmus, bishop of Lucca, was elected and consecrated pope, under the name of Alexander II. Thus the Romans asserted the right of free election, and the imperial confirmation was no longer considered necessary for the consecration of the pope elect. The ministers of Henry, irritated at the conduct of the Romans, refused to acknowledge Alexander, and at the same time the Lombard bishops, especially those who were favourable to the marriage of the priests, had, with the support of the imperial court, elected Cadalous, bishop of Parma, a prelate wealthy, but of loose principles, who assumed the name of Honorius II. Cadalous, having raised with his money an armed force, marched in the following year to Rome, where he had many partizans, among others a certain Pietro di Leone, or Pierleone, a converted Jew, very wealthy, but disliked by the people as a usurer. Cadalous defeated the partizans of Alexander, but Godfrey, duke of Tuscany, having come to his assistance, Cadalous was obliged to retire. He returned the following year, entered the Leonine town or suburb, and took possession of the castle of S. Angelo, but the people rising in arms, he was unable to enter the Vatican Basilica, and he shut himself up in the castle, where he remained blockaded for nearly two years, and at last escaped by paying a large ransom. Alexander was then universally acknowledged pope. He died in 1073, and was succeeded by Hildebrand, who assumed the name of Gregory VII., by which he is known in history. Soon after the famous quarrel of the investitures broke out between the church and the empire. The events of Gregory's busy pontificate are related under GREGORY VII. Rome was entered by force by the emperor Henry, in the year 1084, and Guibert, archbishop of Ravenna, was consecrated pope by the name of Clement III., and he afterwards crowned Henry emperor in the Vatican. On the approach of Robert Guiscard, with his Normans, Henry withdrew and Robert entered the city, but it seems that his soldiers, and especially the Saracen bands in his service, committed all sorts of atrocities, and that a part of Rome extending from the Lateran to the Colosseum was set on fire. When Robert retired from Rome to his dominions, Gregory, not thinking himself safe, withdrew to Salerno, where he died, A.D 1085. His successor, Victor III., was opposed by the antipope Guibert, and the imperial party, who had possession of the Vatican and of the Capitol, until the countess Matilda came with her troops, when Victor entered Rome and took possession of the city, which however he was soon after obliged to leave again. He died at Monte Cassino, and his successor, Urban II., finally drove away Guibert. Urban died in 1099, and was succeeded by Paschal II. During his pontificate Henry V. visited Rome to be crowned, A.D 1110, and a scene of outrage followed, which is related under PASCHAL II.

In 1116 we find Pietro di Leone applying to Paschal to use his influence to have one of his sons appointed prefect of Rome. The people of Rome, who disliked Pierleone and his family, elected the son of the late prefect, a mere boy, and presented him to the pope for his confirmation. Paschal refused, and an affray followed during the holy week between the populace, led by Tolomeo, brother of the late prefect, and the pope's armed men. The country around rose in arms, and Paschal withdrew to Sezze. The mob sacked and destroyed the houses of Pierleone and his family.

In the following year Henry V. came again to Rome, and was crowned by the archbishop of Braga, Paschal having fled to Benevento, which had become a favourite place of residence of the popes. Henry won the hearts of the chief Roman nobles by gifts and promises, and even gave one of his ighters in marriage to one of the Tolomei, a noble family hat time. After Henry's departure from Rome, Pas- l came with his troops to Anagni, where be fell ill: he rover advanced to the gates of the Vatican, which was upied by the Imperial party, and while the military en- es were being disposed for the attack, Paschal expired, 1118. He was buried without any opposition in the ilica of the Lateran, and three days after the cardinals ted Giovanni Gaëtano, cardinal chancellor of the Roman h, who took the name of Gelasius II. Cencio Fran- ne, a partisan of the emperor, disapproving of the elec- broke open the gates of the Lateran Basilica, seized pope elect, an old man, by the neck, and kicked him and d him to his own house, where he kept him in prison. prefect of Rome, many of the nobles, and the people ranstevere rose against Frangipane and his adherents, l ob d him to release the pope, who was carried in ck to the Lateran. Henry however returned to with armed men, and the pope, alarmed, fled by night , from whence he went to Gaëta. Henry then an antipope to be elected, who assumed the name of ry VIII. After a time Gelasius returned to Rome, battle ensued between his partisans on one side, and opposite faction, led by the Frangipani. Gelasius de- ed that he would remove his residence far from Rome, called a new Babel, where everybody wanted to embarked for France, leaving the bishop of Porto his vicar at Rome, a Norman, named Stephen, as , and confirming the son of Pierleone as pre- city. He died in the monastery of Cluny, in , 1119. His successor, Calixtus II., was elected in by the few cardinals who were there, and his election pproved by the cardinals and clergy of Rome as a mat- of necessity, circumstances preventing the election being l at Rome according to custom, as the antipope Gre- had still possession of the city. In 1120 Calixtus came taly, and in the following year, with the assistance of Normans, he entered Rome, and having taken the anti- e prisoner, shut him up in a fortress. In 1122 the dis- of the investitures was settled between Calixtus and V. Calixtus died in 1123, and the cardinals elected ert, bishop of Ostia, who assumed the name of Ho- II. t a body of bishops assembled in the church of ius elected Theobald, surnamed 'Bocca di pe- cardinal of Santa Anastasia. The powerful family of pani supporting Honorius, Theobald was induced his claim, and Honorius submitted to a second by the clergy and people, who confirmed him. This es to show that notwithstanding the alleged decree of II., the cardinals had not yet monopolised the ex- of electing the popes. Honorius granted to r of Sicily the investiture as duke of Apulia . On the occasion of the disputed succession e crown of Germany, between Lotharius and Conrad of Honorius excommunicated Conrad, and acknow- Lotharius. Honorius died at Ostia in 1130. Several dinals elected cardinal Gregory, a man universally u, who assumed the name of Innocent II.; but an- and, it is said, a more numerous party, chose Peter, of the sons of the said Pierleone, who assumed the of Anacletus II.; and, being the strongest, they took ssion of the Vatican. The Frangipani declared in r of Innocent, whom they received in their palace, or in t buildings, for this family seem to have had a whole district, which they had fortified. , with the treasures found in the Vatican and churches, enlisted a number of mercenaries, attacked arter of the Frangipani, and obliged Innocent to to Pisa, leaving the bishop of Sabina at Rome as his ocent repaired to France, where he was recognised e pope; and at Liège he crowned Lotharius king of and Italy, who promised to assist Innocent in his see. Anacletus was acknowledged by the nd by Roger of Sicily, whom he caused to be king by his legate at Palermo, in 1130. In 1133 s and pope Innocent advanced to Rome, and being by the prefect and several nobles, entered the city. took possession of the Lateran, Lotharius fixed ence on the Aventine, and Anacletus shut himself he castle of S. Angelo, from whence he sent re- messengers to Lotharius, asking for a canonical into his election and that of his competitor Inno- Lotharius refused this apparently reasonable demand, but as he was not strong enough to drive out Anacletus, whose party occupied the Vatican, it was resolved to crown Lotharius in the Lateran; after which the emperor returned to the north, and Innocent soon after followed. Innocent had a powerful support in St. Bernard, the celebrated abbot of Clairvaux, who induced the kings of France and England, and the people of Milan and other Lombard towns, to acknowledge him as pope. [BERNARD, ST.]

Lotharius, in 1137, after an expedition into Apulia against Roger of Sicily, returned northwards by way of Rome, when Innocent again took possession of the Lateran; Lotharius however did not stay at Rome, but moved on towards Germany, and died at Trent the same year. St. Bernard advised both Innocent and Anacletus to take Roger of Sicily for their umpire, and each to send three cardinals to Salerno. Roger, after listening for four days to the two parties, could not come to a decision, but desired one cardinal on each side to accompany him to Sicily, where he would assemble a council of the bishops and abbots of that kingdom.

Anacletus dying (A.D.1138), his party elected in his place Cardinal Gregory, who assumed the name of Victor IV.; but St. Bernard by his eloquence persuaded him to renounce in favour of Innocent. The sons of Pierleone also made their submission, kneeling at the feet of Innocent, and swearing allegiance to him, and all Rome acknowledged him as pope. Thus ended (St. Bernard, *Epist.*, 328) this schism, which is one of the most intricate as a question of right in the whole history of the papacy.

The cardinal of Aragon, in his 'Life of Innocent II.,' observes that, through the exertions of Innocent and of St. Bernard, 'a profound peace reigned at Rome, such as was not remembered for a long period.' Innocent led his troops against Roger of Sicily, but was defeated and taken prisoner near St. Germano. Roger treated him with great honour, and obtained of him the confirmation of his title of king, and that of his son as duke of Apulia, A.D. 1139. Innocent returned to Rome, where the people bore impatiently the temporal power which was exercised by him with a firm hand, and a war with their neighbours of Tibur, which broke out in 1141, led to a total change of affairs. The people of Tibur, having surrendered in 1142 to Pope Innocent, gave up themselves and their county or territory, which embraced the valley of the Upper Anio, 'to Pope Innocent and his successors.' This excited the jealousy of the Romans, who requested the pope to raze Tibur to the ground, and to disperse the inhabitants. Innocent refused, and the people, in 1153, ran to the Capitol, restored the Roman senate, of which nothing is heard for a long period previous, as a sovereign council, and declared war again in the name of the senate and people of Rome against Tibur. This insurrection of the Romans is partly attributed to the spread of the republican doctrines preached by Arnaldo of Brescia, who had been banished from Italy by Innocent some years before. [ARNALDO DA BRESCIA.] Innocent, unable to put down the revolt, fell ill, and died in September. 1143. He was a remarkable pontiff for his abilities and determination. His successor Celestine II. died after a few months, and Lucius II., who succeeded Celestine, found himself controlled at Rome by the senate, which sat in the Capitol and exercised sovereign power. As for the nominal Imperial authority, it was utterly obliterated, the crown of Germany being then contested between Conrad of Suabia and Henry Guelph. In 1144 the Romans elected as princeps senatus, and patrician of Rome, Giordano, another son or grandson of Pierleone; as Alberic had been elected two centuries before. In 1145 Lucius attempted to force the Capitol at the head of some armed men, but the senators and the people threw showers of stones upon him, one of which mortally wounded the pope. The cardinals elected Bernard of Pisa, a disciple of St. Bernard, who assumed the name of Eugenius III. The senate however refused to permit his consecration unless he acknowledged their sovereign power, and Eugenius withdrew by night into Sabina with some cardinals, and was consecrated in the monastery of Farfa. About this time Arnaldo da Brescia came to Rome, and added to the popular excitement by his preaching in public on politics. He exhorted the Romans to restore the equestrian order and the other institutions of the antient republic. The mob, who cared little for the equestrian order, or any order whatever, ran to the houses of the cardinals and nobles who were suspected of belonging to the papal party, and sacked and destroyed them. They abolished the office of prefect of Rome, and obliged all the nobles to swear allegiance to the patrician Giordano. Eugenius excommunicated Giordano, and in the following year, being supported by the people of Tibur, he returned to Rome by virtue of a convention in which he recognised the senate as a legislative body, and the Romans agreed to dismiss the patrician, restore the prefectship, and acknowledge the pope as their sovereign. But this concord was precarious, and in 1146 Eugenius was obliged to quit Rome. He returned again in 1149, but was soon obliged to leave it, and take refuge in Campania. St. Bernard, in his book 'De Consideratione,' which he addressed to Eugenius in his exile, observed that the perverseness of the Romans had been notorious for centuries, that they were 'a people unused to peace, fond of tumults, intractable and remorseless, not knowing how to obey unless they could no longer oppose resistance.' In 1152 Eugenius returned to Rome under a convention, the terms of which are not known; and he applied himself to gain the affection of the lower orders by his liberality, and 'he would have succeeded,' says a contemporary chronicler, 'in upsetting the senate, had not death cut him short in the same year.' Before his death he is said to have concluded a convention with the new king of the Germans, Frederic I., by which the latter bound himself not to enter into any agreement with the people or senate of Rome, nor with Roger of Sicily, without the participation of Eugenius or his successors, and to defend the rights of St. Peter; and the pope on his part promised to crown him emperor. (Vitale, *Storia Diplomatica dei Senatori di Roma.*) Of Anastasius IV., who succeeded Eugenius, little or nothing is known. He died in 1154, and was succeeded by Nicholas Breakspeare, bishop of Albano, an Englishman, who assumed the name of Adrian IV. The senate was then in the plenitude of its power; money was struck with the heads of St. Peter and St. Paul on one side, and the legend 'Senat. P. Q. R.' on the other; all acts were done in its name, and the years were dated from the restoration of the senate, 'Anno . . . Senatus.' It appears that the senators were fifty-six in number, annually renewed or confirmed, they were elected by a body composed of delegates, ten from each region of the city. The president of the senate was styled 'Dei Gratia Summus Senator;' it appears also that there were consuls chosen from among the senators.

An affray which took place in Rome soon after Adrian's election, and in which a cardinal was mortally wounded, induced the new pope to leave Rome, which city he placed under an interdict, forbidding divine service to be celebrated within its walls. This novelty, which had never occurred at Rome, made a great impression on the minds of the people, who sent away Arnaldo, and invited the pope to return and remove the interdict. In 1155 Frederic I. came to Rome to be crowned, accompanied by an army. Before he entered the city, he gave orders that Arnaldo, who had taken refuge in Campania, should be tried as a heretic. The count of Campania gave him up to the prefect of Rome, by whose sentence he was hanged, his body burnt, and the ashes scattered to the wind. The circumstances attending Frederic's coronation are given under ADRIAN IV. Frederic spoke to the Romans as their master, but he could not subdue them; his soldiers took possession of the Vatican, but the people of Rome kept aloof from the ceremony of his coronation: they even assailed and killed a great number of the German soldiers, and both Frederic and the pope hastened away to Tibur.

The wars of Lombardy prevented Frederic from attending to the affairs of Rome, and Adrian, having quarrelled with him on some points of jurisdiction, had no support to expect from him. Adrian during the rest of his pontificate was generally absent from Rome, where probably his temporal authority was not great. He died at Anagni in 1159. His successor Alexander III., although duly elected by the majority, found a competitor in cardinal Octavianus, who, having had some votes in his favour, and being secretly encouraged by Frederic's missi at Rome, assumed the pontifical robes, and took the name of Victor IV. The Frangipani and the people took the part of Alexander, who however was obliged to quit Rome, and was consecrated at Ninfe. The antipope was consecrated by some bishops of his party at Farfa in Sabina. Alexander returned to Rome in 1161, but finding that the antipope, supported by the emperor and by many of the Roman nobles and senators, was master of the field, he went to France. He
left however a cardinal as his vicar at Rome,
session of the Vatican. The antipope died
1164, but a successor was appointed through the
of Frederic, by the name of Paschal III. In
Alexander returned to Rome, and was received
united senate, clergy, and people with great
Alexander was then at open variance with Fred
the Romans, who disliked that emperor ever sinc
visit, made common cause with the pope. In 1167
marched against Rome, but on his way he laid
Ancona, which had joined the league of the Lomb
against him, and which made a long resistance The
attacked Tusculum and Alba, which towns were
of the Imperial party. The count of Tusculum
Raynaldus, archbishop of Cologne, and Christi
bishop of Mainz, who commanded the emperor's
central Italy, and a battle took place near Tus
which the Roman militia, to the number, it is said,
were completely routed by the Imperial troops and
Tusculum, and their loss has been, by the exaggerati
contemporary chroniclers, compared with that of
Soon after, Frederic came in person, accom
the antipope Paschal; he forced the walls of th
but found the Basilica strongly defended by the
of St. Peter's, that is to say, a body of militia
the domains of the Roman see. After a wee
German soldiers set fire to a tower close to the
the little garrison capitulated. Frederic b
trigue with the leaders of the Romans, Ale
it prudent to quit the city. The Pisan galleys al
up the Tiber as auxiliaries to Frederic, and th
then came to terms. Frederic confirmed the
the municipal franchises of the city, and the
their part, with the exception of the Frangipani,
leoni, and some other nobles, acknowledged Fr
emperor and king of the Romans. In the oath te
the occasion no mention appears of either pope or
The summer brought disease into the emperor's c
he withdrew to the north, leaving a prefect at R
the following year the Romans destroyed Alba; an
attacked Tusculum, which, in order to save itsel
dered to the pope, who was then at Benevento.
pope Alexander made his peace with the emperor, a
as mediator at Venice between him and the Lomba
A truce for six years was agreed upon, which led af
to the famous peace of Constance (1183). The
Rome, seeing a good understanding restored bet
pope and the emperor, thought it prudent to come
finitive arrangement with the former, and sent a de
to invite him to return to Rome. Alexander sent th
nals to confer with the senators on the subject, wh
agreed, after long debate, that the senate should
that on the renewal of that body, at the next S
kalends, they should take the oath of allegiance to
and the Roman church, and should swear to do not
trary to the papal dignity. The Vatican was restor
pope, with all the rights of St. Peter. Alexander
entrance into Rome, A.D. 1179, amidst popular acc
In the year 1181, Alexander died; a pontiff distingu
his great qualities, and the events and length of hi
cate. He was succeeded by Lucius III., a weak m
whose accession the Romans proposed to re-establish
of Patrician as head of the senate, and as the fir
trate and chief of the administration of the city, ind
of the pope. Lucius opposed this measure, and wa
to leave Rome, and the Patrician was appointed.
died at Verona, in 1185. His successor, Urban
elected and consecrated at Verona, and he died in
Ferrara, without, it seems, having visited Rome.
cessor, Gregory VIII., died at Pisa in the followi
and the successor of Gregory was styled Clement
came to an arrangement with the Romans; one of
ditions of which was that the senate should be co
but that the senators elect were to receive the in
'per mantum' from the hands of the pope. Vitali
text of this convention, which is styled 'Concord
the year 44 of the senate, with the names of all the
who signed it. The number of senators having
much increased by the ambition of belonging to
Celestine III., who succeeded Clement in 1191,
that in future they should not exceed fifty-six. H
same time solemnly confirmed and determined th
tives of the senate by a charter which is found in

tiqu. Ital. Dissert., 45). During Celestine's pontificate owever the Romans became tired, it is not very clear hy, of their senate, and they elected only one senator, hom they made the head of their militia, and their first ju-icial magistrate; the senatorial palace in the Capitol was is residence. The first senator thus appointed was Bene-etto Carissimo, who, after two years, was succeeded by Gio-anni Capoccio. The Romans obliged the towns of Sabina the Campagna to receive in future their magistrates Rome. Innocent III., who succeeded Celestine in 1198, not a man to forego an opportunity of asserting and ex-nding his authority. He contrived by his influence to have senator elected from among his friends, and he dictated form of the oath which that magistrate was to take to The senator bound himself to maintain the pontiff n possession of the rights which belong to St. Peter's see; ot to conspire against him, but to reveal to him all con-es which might come to his knowledge; and lastly, o provide for the safety of the cardinals and their house-old within the jurisdiction of the city of Rome. (Vitali, *Storia Diplomatica.*) At the same time, Innocent, under he pretence that the empire was then vacant, and the suc-ession to the German crown dubious, obliged the prefect f the city, who had been till then appointed by the em-eror, to receive a fresh investiture from himself, and pay llegiance to him; and he also removed the judges and odestas of the towns of the Campagna, who had been ap-ointed by the senate in the name of the Roman republic, nd he appointed others in their places. The authority of senate and that of the emperor over the city of Rome thus virtually at an end. [INNOCENT III.]

nder the pontificates of Innocent and his successors rius III. and Gregory IX., Rome remained in quiet ction to the papal authority. After the death of Gre-ory. A.D. 1241, Frederic II., who had long been at va-e with the pope, devastated the territory of Rome; and favoured by the powerful baronial family of Co-, who were of the Guibeline party. The cardinals ran way from Rome; and it was not till 1243 that they assem-bled at Anagni, and elected pope Sinibaldo dei Fieschi, who assumed the name of Innocent IV. He was haughty and determined; he showed himself bitterly hostile to Frederic; and the papal troops, commanded by Cardinal Octavian, conquered the whole Romagna in 1248. Frede-ric II. died in December, 1250. Innocent was long absent in France and other places, and when he returned to Rome, about 1253, he found his capital in a state of anarchy. The turbulent barons, emboldened by the absence of the pope, and the dissensions between him and the emperor, had resumed their old habits of plunder and civil warfare. They had fortified themselves in the massive antient monuments, and had also raised lofty towers, in which they kept a num-ber of armed retainers, and from thence sallied to attack their weaker neighbours. The citizens of Rome elected for their senator Brancaleone of Bologna, who for several years hunted down the refractory nobles, razed their towers, and at last restored order. He died in 1258, and his relative Cas-tellano was elected senator in his place. [BRANCALEONE D' ANDALO.]

Alexander IV., who succeeded Innocent IV. in 1254, who died in 1261, was succeeded by Urban IV., a nchman, who determined on the ruin of Manfred, the scion of the house of Suabia. For this purpose, he ed the crown of Sicily to Charles of Anjou, and made ikewise senator of Rome, the people having conceived wish of having a powerful prince for their chief magis-. Urban however died in 1264; but his successor nt IV., another Frenchman, pursued the same policy, rles of Anjou embarked at Marseille, and arrived at , where he collected his troops for the invasion of nes. The battle of Benevento and the death of Man-lowed. In 1268, young Conradin came to Italy upon ric errand of recovering his paternal kingdom. entered Rome, where he was received with applause by Guibeline party, which was strong in that city; but he oon after defeated at Tagliacozzo, taken prisoner, and aded at Naples. Gregory X., Clement's successor, d Rome with King Charles of Naples, who swore nce as a feudatory of the holy see. Nothing particu-ccurred at Rome during that and several following pon-; but Cardinal Orsini, being elected in 1277 by the of Nicholas III., applied to Rudolph of Habsburg, of Germany, to define by a charter the States of the Church, and separate them for ever from those dependent on the Empire. He sent him at the same time copies of the former charters of donation, real or supposed, of his imperial predecessors. Rudolph, engrossed with German affairs, and little acquainted with those of Italy, wishing also to oblige the pope, from whom he expected the Imperial crown, defined by letters patent, dated May, 1278, the States of the Church as extending from Radicofani to Ceprano on the frontiers of Naples, and from the Mediterranean to the Adriatic, including the former duchy of Spoleto, the March of Ancona, and the Romagna. He released the people of all those places from their oath of allegiance to the Empire, giving up all rights over them which might still be settled in the Imperial crown, and acknowledging the sovereignty of the same to belong to the see of Rome. This important document, which is found in Raynaldus (*Annales*), was confirmed by the electors and princes of the Empire. Thus ended the former Imperial authority over Rome and its territory.

Period VI.:—Rome under the sovereignty of the Popes.—Nicholas, having thus freed himself from all dependence on the emperor, determined to shake off also the importunate interference of his powerful vassal, Charles of Naples, who, in his quality of senator of Rome, exercised a sort of absolute sway over that city and territory. With much difficulty he prevailed upon Charles to renounce his office, and by a constitution he then forbade the election as senator of Rome of any emperor, king, prince, duke, marquis, or other powerful personage. In apparent contradiction to this constitution, he caused himself to be appointed perpetual senator of Rome, and he named as his vicar his nephew Orso. Nicholas embellished Rome with several new buildings; he began the Vatican Palace; but he also enriched his nephews, and the system of nepotism may be said to have begun with him, as well as the rivalry between the Orsini and Colonna parties. He died near Viterbo, in 1281.

After the death of Nicholas a party rose against his nephew Orso, and it was agreed that two senators should be elected, one of the Orsini family and the other of the Annibaldeschi. After an interregnum of six months, a French cardinal was elected through the influence of Charles of Naples, and was styled Martin IV., who declared himself perpetual senator, and appointed King Charles as his substitute. Nothing very particular seems to have occurred at Rome till 1293, when, during the interregnum after the death of Nicholas IV., great disorders broke out, accompanied by robberies, murders, and fires. Rome was without a senator for six months, and at last two were appointed, one from each of the two rival parties. The cardinals elected Celestine V., who however soon after resigned on the score of incapacity, and Cardinal Gaetani was elected, by the name of Boniface VIII., A.D. 1295. His was a most stormy pontificate. He quarrelled with Philip le Bel of France, with Frederic of of Sicily, and with the Colonna. Two cardinals of the great baronial family of Colonna had opposed his election, and they refused to admit a papal garrison into their patrimonial towns and castles which they had in the Campagna. They were also accused of holding intelligence with Frederic, king of Sicily, who had been excommunicated by the pope. Boniface excommunicated the cardinals Colonna and all their adherents. The Orsini family, rivals of the Colonna, supported the pope. The Colonna fortified themselves in their castles, protested against the election of Boniface as illegal, and appealed to a future general council of the church. Upon this Boniface ordered their palace at Rome to be pulled down, and sent troops to attack their towns and castles in the country. In 1298 he took Palestrina by treachery, and razed it to the ground. [PALESTRINA.] He took likewise Zagarolo and La Colonna, fiefs of the same family. The cardinals Colonna escaped to France. Their uncle, Sciarra Colonna, went to sea, was seized by pirates, and, after a course of romantic adventures, found his way back to Italy, where he had his revenge, and caused the death of the pope, in 1303. [BONIFACE VIII.] In 1300 Boniface celebrated the first Jubilee at Rome, and thus a new source of attraction and wealth was opened to that city. [PILGRIMAGE.]

Benedict XI. succeeded Boniface. By the assistance of Charles II. of Naples, he restored peace to Rome and its territory; he absolved the Colonna and their adherents from the canonical censures, except those who had lifted up their hands against the late pontiff. In the following year, 1304, however, finding that the factions were still active in Rome, and many crimes were committed with impunity, he repaired to Perugia, where he died, and, as it was reported, by poison. The interregnum lasted eleven months, the cardinals being divided between those who wished for an Italian pope, and those who, being in favour of Philip of France and Charles of Naples, wished for a French pope.

The people of Perugia, tired of delay, kept the cardinals in arrest in the Conclave Hall, and threatened to starve them if they did not come to a decision. The French party prevailed, and Bertrand, archbishop of Bordeaux, was elected. It is said that he had promised to Philip le Bel to restore the Colonna cardinals to their dignities and possessions, to allow the king to dispose of the tithes for five years, to appoint a certain number of cardinals according to his pleasure, and, lastly, to remove the papal residence to France. Bertrand, who assumed the name of Clement V., did not go to Rome; he was consecrated at Lyon, and, having summoned the cardinals to France, fixed his residence at Avignon, A.D. 1305. For seventy years after this the popes resided at Avignon; and this period was styled by some Italian writers the Babylonian captivity.

Period VII.:—The Papal See at Avignon, 1305-1376.—During this period Rome and its territory were administered, in quiet times, by the popes' legates: the great families Colonna, Orsini, and others held the chief authority in their hands, and the city was often a prey to factions and civil war. Two senators were elected annually by the pope from among the great families, but in turbulent times they were chosen by the people. In 1311, Henry of Luxemburg, king of Germany, commissioned Stefano Colonna to uphold the Imperial or Guibeline party at Rome, preparatory to his going there to be crowned emperor. The opposite party, or Guelphs, led by the Orsini, and supported by Robert, king of Naples, had taken possession of S. Angelo, Borgo, the Vatican, and all Transtevere, and also of the Capitol, and of the tower of the market, which was then at the foot of the Capitol. [ORSINI.] The Colonna party fortified the Pantheon, the Colosseum, the Aventine, and the tower of Milizia, which was afterwards enclosed within the monastery of Santa Catarina da Siena.

The streets were barricaded, and the whole town was in arms. At last Henry came, with a considerable force of men and horse, and partial combats took place between his troops and those of king Robert, but Henry, being unable to take the Vatican, was crowned emperor in the Lateran, by the papal legate, soon after which he left Rome.

When Louis of Bavaria came to be crowned at Rome, accompanied by Castruccio Castracani, in January, 1328, the ceremony passed off more quietly. Louis, supported by Sciarra Colonna, took possession of the Vatican. From the Capitol he harangued the people, who elected him senator and captain of the city for one year. Louis was crowned in the Vatican by two bishops, who however had no papal commission for the purpose, and one of whom was even under an interdict. The emperor appointed Castruccio senator and imperial vicar, and afterwards convoked a 'parlamento,' or assembly of the people, in the square before St. Peter's, in which he summoned John XXII., who was at Avignon, by the name of Jean de Cahors, or any one to answer for him; but no one appearing, a syndic of the clergy demanded that the accused should be tried *en contumace*, as guilty of heresy and high treason, and the emperor pronounced him guilty, and a new pope or antipope was elected by the name of Nicholas V. [JOHN XXII.] It was also decreed by the emperor, with the hearty approbation of the people, that every future pope should reside at Rome; and if absent for more than three months, should be considered as deposed. Louis however left Rome, Castruccio died, Nicholas renounced his claim to the papacy, and pope John recovered the ascendancy at Rome, although he continued to reside at Avignon. It was soon after this that the electors of Germany passed a resolution declaring that in future the king of Germany elect should be considered emperor and king of the Romans, without the sanction or consecration of the pope.

When Peter of Limoges was elected pope by the name of Clement VI., in 1342, the Romans sent him ambassadors, one of whom was Cola di Rienzo, or Nicolas, the son of Lorenzo, a tavern-keeper, to beg the restoration of the papal see to Rome. Petrarca, who was at that time residing at Rome, where he had received the poetical crown in the Capitol
from the hands of one of the senators, also unsu
exerted himself to induce the pope to return to tha
[PETRARCA.]

In 1347 began the insurrection of Cola di Rienz
in the protracted absence of the popes, was left
its factions, each of whom chose one of the two
and it may be easily imagined that little harmony
between those two head magistrates. Cola was
warm imagination, imbued with vague and confus
of the former glory of Rome, and endowed with
eloquence. He began to declaim in public against
orders of the nobles and the tyranny of factions. T
named him by acclamation their tribune. He we
Capitol, drove away the senators, and assumed th
'Nicholas, severe and clement, liberator of Rome
for the weal of Italy, friend of the world, tribune
He appointed various magistrates, mostly deservi
and put to death several factious leaders who were
of heinous crimes, and obliged the rest to swear
to him, under pain of banishment. He also sent
dors to various towns and princes, for the purpose of
a union of all Italy. Perugia, Arezzo, and oth
submitted to him; and he threatened with war
which refused allegiance. He summoned Cle
with the cardinals to return to Rome; and he
moned Louis of Bavaria, Charles, king of Bohemia,
electors of Germany, to state their reasons for pr
to elect the emperor. To the papal vicar at Rome
monstrated with Cola upon his presumption, he
that he was inspired by the Holy Ghost, and tha
lowed its dictates. He arrested the heads of the
Savelli, Orsini, Colonna, and others, and threaten
with death; but he only banished them. The
lected and armed their feudal dependants, and
against Rome; but the people, led by Cola, issu
Porta S. Lorenzo, defeated them, and killed sever
Colonna. In the following year however, Cola ha
with a check at the siege of the castle of Marin
belonged to the Colonna, his enemies, stirred by
legate, excited a revolt against him. Cola's soldi
overcome, and he withdrew into the castle S. Ang
which he escaped, disguised as a monk, into the
The Colonna re-entered Rome; and Stefanuccio,
nello Colonna, restored the city to the papal a
annulled all the acts of the tribune, and appointed
tors, one of the Orsini and one of the Colonna.
Rienzo, being taken, was confined in a prison at
In 1348 Queen Joan I. of Naples sold Avignon and
tory to the papal see for 30,000 golden florins.

In 1353 a tumult broke out at Rome, in conseque
scarcity; and one of the two senators, Bertoldo degl
was killed by the mob. Stefanello Colonna esca
the same year Pope Innocent VI. sent Cardinal G
noz, his legate, to Italy, to restore the papal author
took with him Cola di Rienzo, to assist him in
Rome. Cola repaired to Rome in 1354, being
senator by the pope. Cola took possession of Ro
put to death Fra Moriale, a famous condottiere,
been guilty of much violence and extortion. The
however were still his inveterate enemies, and C
rashness ruined himself. He laid a fresh duty up
he caused Pandolfuccio di Guido, a man much be
the people, to be beheaded on slight grounds; he
suspicious and cruel; and the people, disgusted
rose in September, 1354, burnt his house, attacked
the Capitol, and having caught him as he was esc
disguise, stabbed him to death. The acts of Cola d
constitute a very interesting episode in the history o
Rome. His life, written in the Romanesco, or diale
lower classes of Rome, is inserted in Muratori's g
lection.

The papal authority was now re-established
and in 1358 it was decided that there should be
senator yearly appointed by the pope, and that he
a stranger, and unconnected with any of the patrici
lies of Rome. But for many years after, Rome b
quently disturbed by insurrections, the pope had s
opportunity of appointing the senator, and the peo
the appointment in their own hands. In 1367 U
came to Rome, where Albornoz had prepared e
for his reception. [ALBORNOZ.] The pope found
a sad state, full of ruins, half deserted, and exhibi
the traces of half a century of anarchy. In 137

Rome to return to France, induced, as Petrarch says is epistles, by the advice of the French cardinals, who retted the easy and loose life which they used to live at ion. His successor, Gregory XI., in 1376, came to , and finally fixed the papal residence there again, e it has continued ever since with some trifling inter-ions. But Gregory found the Romans rather restive. twelve caporioni, or heads of districts, would not give heir command, and retained the salaried armed com- called 'banderesi.' At the same time the pope's e in Romagna gave up Cesena to his mercenary bands llage, when 4000 people were murdered, and the young a violated. In the meantime Gregory was busy re- he churches of Rome, which had become, according xpression of some historians, the haunts of owls and He died in 1378.

eriod VIII.:—Rome after the Restoration of the Papal —After the death of Gregory XI., in March, 1378, the nch cardinals, who formed the most numerous part of conclave, wished to elect a French pope, who should fer the papal see back to Avignon; but the people of e assembled tumultuously in the streets, and called for lian, or rather a Roman pope; and the magistrates of y in alarm sent a message to the conclave to the same At last Cardinal Prignano, archbishop of Bari, a litan, was chosen. The people, being still dissatisfied, e into the conclave hall, and most of the cardinals away. The magistrates however restored peace, and ano was consecrated under the name of Urban VI. French cardinals however, supported by Queen Joan ples, who disliked and feared Prignano for his harsh ious temper, assembled at Fondi, protested against the n of Prignano as having been compulsory, and chose ert, cardinal of Geneva, who assumed the name of Cle-t VII. Thus began a schism which lasted nearly half ury, and which has been called the great Western France, the duke of Savoy, and Queen Joanna of acknowledged Clement; Germany, England, and l Italian states acknowledged Urban. The history of contest forms part of the history of the church. Its s upon Rome were most lamentable; for although an and his successors were acknowledged there, and been since considered by the church as legitimate s, yet Clement and his successors, who resided chiefly rance, had a strong party among the Roman nobles, this gave rise to civil commotions in the city, from h the pope was repeatedly driven away. The ulent career of Urban is noticed under URBAN VI. successor, Boniface IX., 1389-1404, had also a most pontificate. He was driven three or four times from by the Colonna and other factions, and as often re- d it by force. His return was generally attended by bed and executions. Innocent VII., who succeeded was a man of a milder temper; but the Colonna, and other factious barons, encouraged by Ladislaus ples, who availed himself of these dissensions to ex- power over Rome and its territory, besieged the the Vatican. One of Innocent's relatives hav- committed an act of treachery by seizing the deputies people who had come to a conference with the pope, hem on the spot, and throwing their bodies into the he people became furious, hunted down and killed ents of the pope, among others many lawyers, and their houses. Innocent escaped to Viterbo, and people plundered the pontifical palace. Ladislaus his troops to take possession of Rome, but the people gates against them. After a time the pope re- o Rome, the people submitted, and Ladislaus also is peace through the mediation of Paolo Orsino, A.D.

nocent was succeeded by Gregory XII., who d to have a conference with his rival, Benedict XIII., then in France, in order to put an end to the . [BENEDICT, ANTIPOPE] A tumult however out at Rome to prevent his departure. The Colonna d the city through a breach in the wall, but were de- by Paolo Orsino at the head of the papal militia; and of their party, being taken, were beheaded. The en left Rome, and repaired to Lucca, for the purpose onference, which however did not take place. In antime Ladislaus, with the connivance of Paolo Or- ok possesion of Rome, drove away the papal vicar, stablished new magistrates. He likewise invaded Rieti, Terni, Todi, Perugia, and other papal territories. In 1409 a council assembled at Pisa, deposed both Gregory and Benedict, and elected a new pope by the name of Alexander V. But neither Gregory nor Benedict submitted to the decision of the council, and Gregory escaped to Naples, where he placed himself under the protection of Ladislaus, to whom, according to Sozomenus, he sold Rome and the other states of the church for a sum of gold. Louis of Anjou, who had claims on the throne of Naples, being supported by the new pope Alexander V., whose legate, Cardinal Cossa, accompanied him, marched upon Rome, and took possession of the Vatican and Castle of S. Angelo; but he could not enter the city, which was defended by the troops of Ladislaus and the Colonna party. Louis and the legate retired, leaving Paolo Orsino with a body of troops under the walls. After a time Orsino, assisted by people within, entered Rome by night, and drove away the soldiers of Ladislaus, who only retained possession of two gates, Porta Maggiore and Porta S. Lorenzo.

Rome was now, nominally at least, subject to Pope Alexander V., to whom the keys of the city were sent with a deputation from the people, urging him to come and fix his residence there. Alexander however died at Bologna in May of the following year, 1410, and the legate Cossa was elected in his place by the name of John XXIII. The new pope visited Rome in the following year, together with Louis of Anjou, who afterwards moved on towards Naples with a large force, under the command of Paolo Orsino, Sforza Attendolo, Braccio da Montone, and other celebrated condottieri, and defeated Ladislaus near Roccasecca; but Louis, through want of money and provisions, was unable to follow up his success, and was obliged to return to Provence.

In the following year, 1412, the great condottiere Sforza Attendolo, whom the pope had made Count of Cotignola, having had some differences with Paolo Orsino, abandoned the pope and the Anjou party, and entered into the service of Ladislaus. The pope now thought it prudent to make peace with Ladislaus, to whom it was said that he paid down 100,000 florins. But in 1413 Ladislaus broke the peace, and sent an army under Sforza to invade the March of Ancona, while another body under the condottiere Tartaglia, entered Rome by a breach in the wall: the pope ran away to Viterbo, pursued by the Neapolitans, who killed and plundered several of his retinue. The pope had displeased the people of Rome, by levying heavy taxes, especially upon wine. Ladislaus came to Rome, took the Castle of S. Angelo, occupied the whole Roman state, and afterwards advanced towards Tuscany, threatening Florence, and indeed all the rest of Italy, when he was attacked in his camp near Narni by a contagious disease, of which he soon after died at Naples, A.D. 1414. Upon his death the papal authorities, supported by the nobles and people, recovered possession of Rome. [JOHN XXIII.]

The general council, having assembled at Constance, deposed John XXIII., as well as his two competitors Benedict and Gregory, and named Cardinal Colonna, by the name of Martin V., A.D. 1417.

Rome was in the power of John's legate, when Braccio da Montone, a celebrated condottiere, attacked it, and being introduced by some partisans, assumed the title of defender of the city, saying that he would keep it for the future pope who should be elected. He appointed a new senator, and besieged the castle, in which the legate had shut himself up. The legate applied for assistance to Joan II., who had succeeded Ladislaus on the throne of Naples. Joan sent Sforza, who entered Rome, defeated the troops of Braccio (who retired to Perugia), changed the authorities, arrested Cardinal Stefanacci, who had taken the part of Braccio, and confined him in S. Angelo, where he was probably put to death, being heard of no more. In the next year, 1417, Sforza returned to Naples, leaving a garrison in Rome for Queen Joan. In 1418, the new pope Martin V. came to Rome, Queen Joan having made an alliance with him. During his pontificate, he strove, and in some measure succeeded in restoring order to Rome, and in recovering most of the territories of the church. Martin died in 1431, and was succeeded by Eugenius IV., who did not imitate the wise conduct of his predecessor. Eugenius had been supported in his election by the Orsini party, and he began his pontificate by persecuting the rival family of Colonna, at the head of which were the nephews of the late pope, and he put to death more than 200 of Martin's agents and adherents. Cardinal Colonna left Rome, and his relatives, having collected their feudal retainers, assailed the city; but they could not enter it, and all their houses and those of their friends in the town were plundered by the mob. In 1433, Fortebraccio, a captain of the pope, revolted, seized Tivoli, and threatened Rome; and in the following year Francesco Sforza, the son of Attendolo, pretending to act in the name of the council of Basle, which was at open variance with the pope, occupied the whole of Umbria, as far as Otricoli. Upon this Eugenius sent his secretary Biondo, the historian, to treat with Sforza, and agreed to make him vicar for life of the March of Ancona, and gonfaloniere of the Roman Church.

Another condottiere however, Piccinino of Perugia, urged secretly by Filippo Maria Visconti, who aimed at enlarging his dominions at the expense of the pope, joined Fortebraccio with a body of horse, and advanced to the walls of Rome. The people, excited by the Colonna, and weary of the oppression of the papal officers, ran to arms, arrested Cardinal Condulmero, the pope's nephew, and invested the pontifical palace, from which Eugenius had just time to escape, disguised as a monk, to Ostia, where he embarked for Tuscany. Fortebraccio and his bands entered Rome, and gave themselves up to plunder and bloodshed, and all sorts of violence. The Romans, being weary of this disorder, sent two bishops to the pope, to beg his return; but the pope remained absent, delegating his authority to the Cardinal Vitelleschi, a bold unscrupulous man, who by means of the sword and the halter, restored peace to Rome and its territory, A.D. 1437. He reconquered Foligno and other towns for the pope, but at last he became suspected of a secret correspondence with the duke of Milan and with Piccinino, and the pope ordered his arrest. Vitelleschi was mortally wounded in defending himself, and being taken into the Castle S. Angelo, died there, A.D. 1440. In 1443, Eugenius returned to Rome, where he opened a council in the Lateran. He formed an alliance with king Alfonso of Naples against Sforza and the Florentines, and thus contributed to keep all Italy in a state of confusion for several years longer. Eugenius died in 1447. His long contention with the council of Basle, and with the antipope Felix, and his other transactions as head of the church, are noticed under Eugenius IV. He was the last pope that has been expelled from Rome by an insurrection of the people. He restored many churches and other buildings in that city.

His successor, Nicholas V., is one of the most illustrious in the long series of popes. He restored peace to Rome and to all Italy, ended the schism with the antipope Felix, embellished Rome with useful buildings, restored the walls and the Basilicæ, and began the Vatican library: he may be considered as having begun a new æra for Rome, in which the city recovered from the distractions and calamities of past ages, and became again a seat of learning, of the arts, and of polished society. [Nicholas V.] In 1452, Frederic III. of Germany came to Rome, where he was crowned by the pope, with great pomp, first as king of Lombardy and afterwards as emperor. He was the last emperor who was crowned at Rome, and the people were greatly rejoiced and almost astonished to see the coronation of a German emperor pass off without tumult and bloodshed.

The last years of Nicholas's pontificate were disturbed by the news of the taking of Constantinople by the Turks, 1453, and also by the conspiracy of Stefano Porcari, a Roman noble and demagogue, which some writers have chosen to look upon as a patriotic effort to restore liberty to Rome, while others have considered it as the last struggle of the expiring factions led by ambitious nobles, who, flattering the populace by empty words of liberty and a republic, had so often brought Rome to the brink of destruction. Porcari had once made an attempt at insurrection in the Piazza Navona, and the pope had treated him leniently, merely exiling him to Bologna. Here he kept up a correspondence with other exiles and malcontents, and appointed a meeting at his house at Rome, in January, 1453. Escaping from Bologna, he repaired to Rome, attended by several hundred men, with whom he was to attack the Capitol, seize the pope, re-establish the senate, and renew in short the scenes of Crescenzio, Analdo da Brescia, and of Cola di Rienzo. Cardinal Bessarion, legate of Bologna, however, having discovered the flight of Porcari, had sent information to the pope. The conspirators were seized in the midst of their nocturnal meeting, with their arms and other evidence of their guilt, and Porcari and nine of e on the battlements of the Castle of

Nicholas V. died in March, 1455. th power firmly established at Rome. He entr d ministration chiefly to churchmen, and this sys archical government has continued to the presen senator remained a lay magistrate, appointed by th The senator must not be a native of Rome. I diction has gradually dwindled to almost no the governor of the city, who is a prelate, has m police under his control, and the senator is president of a court of première instance for civil which is composed of himself and three conserva lay judges, generally noblemen, who are appointe pope, and renewed every six months, and of the p caporioni, or head of the head-boroughs of the districts of Rome. This court, called Tribunale d pidoglio, takes also cognizance of petty offences a demeanours. The senator has also the superinten the markets, of the annual horse-races, and a great processions and other public ceremonies.

The successors of Nicholas V., during the rema the fifteenth century, consolidated the papal power i and Alexander VI. and Julius II., at the begin following century, extended it to the rest of the of the See of Rome. [Papal State.]

Nicholas V. was succeeded by Calixtus III., wl tificate does not exhibit any important feature. tory of the city of Rome henceforth becomes id with that of the popes, and may be traced, in order under the heads of Pius II.; Paul II.; Sixtus I nocent VIII.; Alexander VI.; and his nephew (Cesare); Julius II.; Leo X.; and Clement VI

Under Clement VII., Rome was stormed, in Ma by an army of mercenary and disorderly Germans, the Constable of Bourbon, who was in the service of V., but who led his freebooting bands against R out any commission from the emperor, and with object than to pay his troops their arrears by givi the plunder of Rome. [Bourbon, Charles de.] T the last storming and pillage of Rome, but it was of the most cruel. From 1527 till 1798 Rome was tered by any hostile army, nor exposed to any poli lution. Of the popes who sat in the papal cha this period of nearly three centuries, the most rem are: Paul III., Paul IV., Pius V., Gregory XIII., V., Clement VIII., Paul V., Urban VIII., Innoc Alexander VII., Clement IX., Clement X., In XI., Innocent XII., Clement XI., Benedict XI nedict XIV., Clement XIII., Clement XIV., VI. Under Pius VI. Rome was occupied without an ance by the armies of the French executive Directory though not actually pillaged by the soldiery, it was fully plundered in a more systematic manner generals, commissaries, and other agents of the In 1799 it was occupied by the Neapolitans, w made it pay dear for what they called its deliveran the French.

In 1800 the new pope, Pius VII., recovered p of Rome, and the memorable events of his l troubled pontificate are noticed under Pius VII the restoration of 1814 there has been no material in the political condition of Rome. The popes w done most for improving and embellishing Rom Nicholas V.; Paul II., who built the Palace of Ve part of the Corso; Julius II.; Leo X., who be ter's church; Gregory XIII., who founded the lege; Sixtus V., who raised most of the obelisks (Borghese), who built the splendid church of Sant Maggiore, the palace Borghese, and other structure gory XV., who founded the Propaganda; Inno who embellished the Piazza Navona; Alexander V raised the present building of the University; I XII., who built the palace for the courts of j Monte Citorio; Clement XI., Benedict XIV., a though not least, Pius VI., who created the Va seum. Besides the popes, many cardinals of the Borghese, Barberini, Farnese, and other famili greatly contributed to the embellishment of moder during the last three centuries. The French tion during its second occupation of Rome, 18 contributed materially to the improvement and orna the city.

MODERN ROME (*continued*).

A sketch of the actual papal administration, its judicial system, its finances, the manufactures and trade of the country, and other statistical details, are given under PAPAL STATE.

With regard to popular education, Rome has adopted no general and uniform system. The rectors of some parishes, aided by charitable individuals, have established parish school, in which poor boys, from five to twelve, are instructed gratis. Other schools are kept by the Scolopj, the fathers of the Christian doctrine, the Ignorantelli, and other clerical congregations, in which boys are taught, either gratuitously or for a trifling fee, writing, arithmetic, grammar. All the children of each parish are required to attend at the parish church every Sunday afternoon to hear the catechism explained, and to be questioned by the rector on points of religion and morality. Besides this, the curate (Sotto Curato) of the parish generally keeps a private school, in which he teaches, for a trifling remuneration, writing and the rudiments of Latin. There are also sixty schools, called regionarie, kept by private teachers, in which about 2000 boys of the middle classes, by paying from half a dollar to a dollar a month, are taught reading, writing, arithmetic, and the elements of Latin and French. These schools are subject to the inspection of a deputation of clergymen, who report to the Cardinal Vicario. Several charitable institutions, such as the Orphans' Asylum, that known by the name of Tata Giovanni, the foundling hospital, that of S. Michele already mentioned, supply elementary instruction to their inmates. Females are instructed in some convents, and in the Conservatorj, where a number of poor girls are lodged, boarded, and instructed, and partly defray, by the produce of their labour, the expenses of the institution, the remainder being made up by legacies and subscriptions. Some evening schools for the children of the working classes have of late years been opened at Rome by benevolent individuals.

For scientific education there is the university called Archiginnasio della Sapienza, which is attended by nearly 1000 students, and has a library, a cabinet of natural history, and other collections: next comes the Gregorian or Roman college, which is now again in the hands of the Jesuits; it has a collection of antiquities and an observatory; and the colleges Nazareno and Clementino, for boarders chiefly of the higher class. An account of the Gregorian college is given in No. I. of the 'Quarterly Journal of Education.' Several public libraries are daily opened at Rome; the principal are those of the Dominican convent of La Minerva, and that of the Augustine convent, called Angelica.

Charitable establishments are more numerous at Rome than in any other Italian city. The principal hospitals are those of S. Spirito and S. Michele, already noticed in the first part of this article; the fever hospital of the Lateran; the hospital of La Consolazione, at the foot of the Capitol, for surgical cases; that of San Gallicano, for cutaneous diseases; that of the Incurabili, or S. Giacomo, near Corso; the lying-in hospital of S. Rocco: the hospital of ta Trinita dei Pellegrini, for poor convalescents; and that he Ben Fratelli, in the island of the Tiber, already men- ued. The Orphan Asylum, the Foundling Hospital of Spirito, and the house for the insane, must also be d. The whole annual revenue of these establishments to 840,000 dollars, of which about one-half is de- from endowments, and the remainder is supplied by papal treasury. The pope distributes yearly out of his private purse from 30,000 to 40,000 dollars among the A commission of subsidies distributes about 172,000 more among poor families. There is also a society rtioning poor girls on their marriage, which expends 132,000 dollars yearly for that purpose. It is reckoned about 1000 girls are yearly portioned in this way. istori, *Statistica;* Morichini, *Su gli Stabilimenti di a Beneficenza in Roma.*) See also Tournon, b. iv., c. 7.

lower orders at Rome live generally very poorly, means of support being scanty and precarious. They nd much on charity, and when years of scarcity or ical convulsions occur, the amount of suffering is very t, as was the case when the French overthrew the l government in 1809. A great part of the population , either directly or indirectly, for their subsistance on papal court, the cardinals and prelates, the nobility, ministers, and foreigners in general.

gy of the city of Rome consisted, in 1838, of 54 rectors of parishes, 1439 priests non-incumbent, 2012 monks or friars, besides 31 prelates, with the rank of bishops, belonging to the papal court. The numbers of nuns was 1456. The whole population consisted of 148,903 individuals, besides 4500 Jews.

The police in Rome is maintained by the Carabineers, a well selected and well equipped military body, resembling the French gendarmes. They are under the orders of the governor of Rome, who is a prelate.

Rome has an insurance company, a bank, and a savings' bank; these institutions have all been established within a few years. The Monte di Pieta is a much older foundation. [MONT DE PIETE.]

Rome had no municipal council when the French took possession of it in 1809, its financial administration being in the hands of the home department. Count Tournon established a municipal council, consisting of the principal nobles and citizens. Its revenues, derived from various taxes and rent of buildings, amounted to 2,800,000 francs. which was found sufficient for the expenditure. We are not acquainted with the alterations that have been made since the restoration of 1814, except that we find in the Motuproprio of Leo XII., 1824, under the head of the 'Organization of the Communes,' that 'with regard to the city of Rome, the rights of the senator and conservatori, and of the Roman people, are maintained in their present state,' which seems to mean the state in which they were before the French occupation.

The population of modern Rome consists of a very mixed race, and the admixture is yearly renewed. The deaths at Rome exceed the births, which is owing in a great degree to the number of people who live in a state of celibacy, not only in consequence of their religious vows, but also from choice. The population is yearly recruited from the provinces; a number of young men come to the capital in quest of employment or to pursue their studies, and many of them settle there. Tournon justly observes that it is out of the question to look at Rome for any descendants of the antient Romans, even among the Transteverini, who by tradition claim that descent. It is in the elevated country near Rome, among the Sabine, Alban, and Cimini mountains, that we may expect to find the descendants of the antient inhabitants of those districts. The men in the city of Rome are not generally favoured by nature, with the exception of the Transteverini, who are usually well made: the women are far superior with regard to form, but after the first period of youth, they become lusty and large, owing probably to their sedentary habits; their busts however are generally handsome.

With regard to their moral qualities, the people of Rome may be said generally to be remarkably keen in their perceptions, disposed to criticism and satire, and yet guarded in the utterance of their sentiments, serious and rather pompous, but withal warm-hearted. Revenge and jealousy are still a source of crimes among the lower orders. 'The modern Romans,' says Tournon, 'are full of intelligence; they have a strong feeling of self-respect, and although prone to anger under provocation, they are, in the common relations of life, gentle, benevolent, and warm-hearted, and particularly expressive of their gratitude. In the manifold relations which I have had with all classes of the Roman people—in the meetings for the drawing of the conscription, so obnoxious to a country to which war and its stern necessities had been strangers for ages; in the midst of the popular festivals; in the fairs and markets—nowhere have I seen traces of that turbulence and ferocity which travellers have been pleased to ascribe to the modern Romans. I have found, among the inhabitants of the most secluded districts of the Campagna, a remarkable mildness of manners, not unmixed with a certain degree of natural politeness; when often alone among them, or in the midst of the formidable Transteverini, my confidence in the good disposition of the people has never been betrayed for a moment, and my own experience, to which I may add that of every other Frenchman in an official situation like myself, has given me a full conviction that it depends entirely upon the government to make these people as orderly and peaceful as those of any country in Europe.' (*Etudes sur Rome*, vol. ii., p. 104.)

The amusements of the people of Rome are chiefly connected with religious festivals. The principal are those of the Holy Week, when the evening service and Miserere at the Sixtine Chapel are celebrated, at which however only a privileged few can be admitted; but then there is the cross of fire suspended above the Confession in St. Peter's church, whither thousands resort, and the aisles of that vast temple become a sort of fashionable promenade. On Easter Sunday the pope officiates with great solemnity in St. Peter's church, after which he ascends the balcony in front of the building, and gives his benediction 'urbi et orbi.' Then comes the great procession of the Corpus Domini, the Thursday after Trinity Sunday, when the pope and all the clergy walk round the colonnade of St. Peter's. Next comes the festival of St. Peter, on the 29th of June, when, in the evening after the ceremonies of the day, the whole exterior of that magnificent building, with its swelling dome, lantern, and cross, is lighted up first by paper lanterns, which give a soft ethereal light, and then, at a given signal, another set of thousands of bright lamps are suddenly ignited, as if by magic, spreading like a blaze of fire along that vast structure. Then follows the Girandola, or fireworks on the castle of St. Angelo, which are far superior to any other fireworks in the world. The Christmas festivals are also splendid. All these have been described by most travellers who have visited Rome, and some of them most beautifully by Madame de Staël in her 'Corinne.'

The profane amusements are those of the Carnival, with its horse-races in the Corso and the masks in the streets; the inundation of Piazza Navona twice a week, in the month of August; the bull-fights and fireworks during the summer season; and the vignate, or country excursions in the autumn. There are generally two if not three theatres open at Rome, one for the Opera Seria, and another for the Buffa, but although the people are very fond of music, yet their rulers, through regard for their profession, abstain from attending plays, and this renders the amusement less national than at Naples or Milan. The fashionable carriage-drives are along the Corso, and outside of the Porta del Popolo, and along the road to Porta Pia.

We must refer for other particulars concerning the habits and pastimes of the modern Romans to books of travels, and especially to that under the name of Stendhal, 'Rome, Florence, et Naples,' and also the 'Promenades dans Rome,' by the same author, and Miss Waldie's 'Rome in the Nineteenth Century.'

The language of Rome is good Italian, but the lower orders, like those of every other country, fall into grammatical inaccuracies, wrong inflections, &c., and have moreover a drawling way of speaking, which is peculiar to them, and is easily recognised. The popular dialect thus disfigured, though much more intelligible than that of most other countries of Italy, is called Romanesco, and there are burlesque poems written in it. One of these is entitled 'Meo Patacca,' the name of a bravo or leader of the lower class of Rome, who, hearing of the siege of Vienna by the Turks, proposes to march to its relief, but after many delays and episodes, the whole troop vent their courage upon the poor Jews of Rome, whose district they take by storm. The following is a sample of the style:

'Era quell' ora ch' i Pizzicaroli
Con le pur iche aggiustano le tenne
Innanzi alle lor mostre, e i Fruttaroli,
E ognun che robba magnatoria venne;
Perchè pe fà servizio a i Nevaroli,
Il caldo insoppurtabile se renne,
E allora il Sol, se non ci son ripari,
Scalla e robbe, e scalla i Bottegari.'

There is another poem, called 'Maggio Romanesco,' by Peresio, which is founded upon the history of Cola di Rienzo. But most of the popular poems, songs, and ballads of Rome are in good Italian. The 'Ritornello' is a favorite composition of the lower classes, and consists of asonante rhymes, such as follows:

'Fiore de Pepe,
E quante me ne dite e me ne fate,
E ch' io ve voglio bene non lo credete.'

A collection of popular Roman songs was published by the Cavaliere Visconti: 'Saggio di Canti Popolari della Provincia Marittima e Campagna,' Roma, 1830. The following is a specimen:

'Palomba che per l' aria và a volare,
Ferma, che voglio dirti due parole,
Voglio cavarti una penna a le tue ale,
Voglio scrivere una lettra al mio amore,
Tutta di sangue la voglio stampare,
Per sigillo le metto lo mio core;
E finita da scrive e sigillare,
Palomba, portacella a lo mio amore.
E se lo trovi in letto à riposare,
O Palomba riposati tu ancore.'

The satirical humour for which the modern Romans have been long celebrated, has been noticed under PASQUIN.

The upper class at Rome consists of two distinct orders: the hierarchy or clerical dignitaries, cardinals and prelates, who constitute the court and cabinet of the pope, and who have in their hands the government, and fill the principal offices in the administration; and the lay nobility, with the titles of princes, dukes, marquises, and counts, who live upon the revenue of their estates, and have little or no influence in political affairs. In the middle class, 'mezzo ceto,' the lawyers form an important order; they are divided into—1, avvocati concistoriali, who alone can plead before the sovereign in concistoro, or papal privy council; 2, avvocati rotali, who plead before the other courts; 3, curiali, or patrocinatori, who are the same as the English solicitors; 4, notaries, who form a corporation under the prefect of the archives. In the early part of the present century, the advocates Bartolucci, Bontadossi, Angelotti, Lasagni, were distinguished among the members of their profession. Among the physicians and surgeons, Bomba, Egidi, Giovannelli, Trasmondi, Savetti, had a considerable reputation.

The artists form another important body at Rome. Many of them are foreigners, but they generally live on good terms, and there is a sort of professional fellow-feeling among them all. The life which the artists lead at Rome, their studies, and their meetings, have been described by Stendhal and other travellers. The Academia of S. Luca, or the fine arts, is the connecting bond of all the artists at Rome. France and other countries have their separate academies, or 'pensionats,' where a certain number of artists of their respective nation are boarded and pensioned by their government for a certain period. The antiquarians have also their academy. Among these the names of Visconti, Fea, Nibby, Ré, and others are well known.

The mercanti di Campagna, or great farmers, who rent the vast estates into which the Campagna is divided, belonging to the nobility, or to various churches, conve[illegible] charitable institutions, or corporations, are a wealthy [illegible] they live in a good style at Rome, have t[illegible]ir coun[illegible] houses, and employ numerous agents, c[illegible]ks, [illegible] and servants. The smallest of these [illegible] requ[illegible] capital of 2000*l*., and the largest of above 20,000*l*. [illegible] the whole of the Roman lowlands, from Corneto t[illegible]racina, are in the hands of about 150 of these fa[illegible] of whom one-third, and those the wealthiest, reside at [illegible] Both Châteauvieux and Tournon give animated desc[illegible] of the farm of Campomorto, which is among the larg[illegible]

Rome is well supplied with provisions; butchers' meat, fish, game, and vegetables are good and abundant; the common country wine is small and light, but the Romans are generally a sober people. Cheese, butter, ricotta, and other produce of the dairy, is plentiful and varied.

In conclusion, there is much that is interesting and much that is good in modern Rome, both materially and morally; but it ought to be borne in mind that the state of society is totally different from what it is in England, Prussia, or France. English travellers have not sufficiently atte[illegible] to this; they have judged of Roman society after the [illegible]lish standard: they have contrasted its stationary but or[illegible], condition, with the prodigious activity, excitement, and perpetual agitation of the population of Britain. But the human race can accommodate itself to various conditions: it can thrive and be content under very different institut[illegible] It is neither possible nor perhaps desirable to make [illegible] once a complete revolution in the habits and ideas of the nations of the earth; that must be the slow work [illegible] time, of education, and of spreading intercourse. This [illegible] been the great mistake of the so-called republicans of [illegible] age; they have considered man as a plastic bei[illegible] wh[illegible] they could remodel at will, without any conside[illegible] his moral feelings, habits of thought, and earl[illegible] [illegible]sions, which will not easily bend themselves to the [illegible] another.

The great mass of the population of the city of Rome [illegible] shown, of late years, that it is, generally speaking, [illegible] tolerable harmony with the form of government. If [illegible] government would but take care to accommodate i[illegible] gradually to the very slow change which must be tak[illegible] place even in the minds of the people of Rome, that w[illegible] be sufficient at present for the purposes of peace, w[illegible] and good government, without any violent and [illegible] change in the established form of society. Some remarks on this subject which were elicited by the abortive insur-

' the northern papal provinces, in 1831, in which
t Rome and the southern provinces did not parti-
ay be found at the end of an article upon 'Rome
'apal Government,' in No. xxi. of the 'Foreign
Review,' January, 1833.

R, OLAUS, a Danish astronomer, was born at
in Jutland, in 1644, of parents who, though not
t circumstances, were able to give their son the
f a scientific education by sending him to the uni-
Copenhagen, where he applied himself diligently
dy of astronomy under Erasmus Bartholinus.
s brought into notice by Picard, who, in 1671, was
France by Louis XIV. to make celestial observa-
ne north, and to verify the position of Uraniburg,
residence of Tycho Brahé. The French astrono-
eived so great an esteem for the talents of the
ne, that he engaged him to visit Paris, and when
cured for him the honour of being presented to
In consequence of this introduction, Römer was
to instruct the Dauphin in mathematics, a pen-
settled on him, and the next year the Royal Aca-
Sciences made him a member of their body.

in France, Römer was employed, together with
sini and Picard, in performing geodetical opera-
the survey of the kingdom; he also assisted at
Observatory at Paris, and from the observations
had occasion to make on the immersions and
of Jupiter's first satellite, he was led to the dis-
certain inequalities in the times of the occurrence
phenomena, which had not before been noticed.
n first remarked, that between the times of the
of Jupiter to the sun and the next following
on, the emersions of the satellite from the shadow
inet took place always later than the times indi-
calculation, and that the difference between the
and the calculated times when the planet was
points of opposition and conjunction was about
ninutes. A contrary circumstance was observed
ime of a conjunction of Jupiter with the sun to
ollowing opposition; for the immersions appeared
ce more early than the calculated times, the dif-
the times, when near the points of conjunction
tion, being also about fourteen minutes.

ppears however to be some uncertainty whether
Cassini (J. D.) is the astronomer to whom the
being the first to perceive the inequality belongs,
ucla asserts not only that the latter made the
but that he gave an explanation of its cause. He
Cassini published, in 1675, a paper in which it is
t the phenomena result from the difference be-
times during which the particles of light are
om the satellite to the earth (the planet being,
pposition, nearer to the earth than when in con-
y the whole diameter of the earth's orbit) and in
inferred that the velocity of light must conse-
such as to allow it to pass from the sun to the
bout eight or ten minutes. On the other hand, it
wn that Cassini at first objected to the transmis-
it through a part of space in a certain time as a
e observed inequality, on the ground that similar
s were not observed in the immersions or emer-
e other satellites. Now it is more probable that the
ronomer should have made objections to the hypo-
nother man, than that he should have abandoned
himself had formed; and even if such abandon-
taken place, Römer ought in justice to be consi-
e real discoverer of this important element in
al science, since it is admitted that he took up
t and gave a precise explanation of the circum-
The reason why the like retardation or accelera-
times was not, then, observed in the second and
ing satellites is, that the theory of the motions
dies was in that age so imperfect, that the times
omena could not be determined by computation
number of minutes to which the optical inequa-
its. It is now well known that the latter takes
larly in the phenomena of all the satellites.

was as good a mechanician as an astronomer. It
re owe the application of the epicycloidal curve in
ion of the teeth of wheels, by which the movement
l uniform; and an account of the invention was
Academy of Sciences in 1675. De la Hire
claimed the honour of having first discovered the advantage of teeth so formed; but Leibnitz, in a letter to John Bernoulli, states that Römer had communicated the invention to him twenty years before the date of De la Hire's publication. Römer is said to have designed several machines for representing the motions of the planets, and particularly one which exhibited the revolutions of Jupiter's satellites; by this machine it is said that the immersions and the emersions might be determined with great precision.

Having remained ten years in France, Römer returned to Copenhagen, where the king, Christian V, made him professor of astronomy. He was at the same time employed in reforming the coin, in regulating the weights and measures, and in making or repairing the public roads. Having acquitted himself in the performance of these scientific commissions to the satisfaction of his sovereign, he was named chancellor of the Danish exchequer, and assessor of the supreme tribunal of justice. At length, under Frederic IV., he became burgomaster of Copenhagen, in which city he died, September 19, 1702, having suffered at intervals from the stone during the three last years of his life.

Peter Horrebow, one of his pupils and his successor in the chair of astronomy, published (1735), under the title of 'Basis Astronomiæ,' the series of celestial observations made by Römer, with a description of the observatory at Copenhagen, and an account of the manner in which the instruments were used.

In determining the apparent places of celestial bodies, it had, previously to the time of Römer, been the practice to observe their altitudes and azimuths, and also their distances from one another or from some body whose place was already found. The trouble of computing the right-ascensions and declinations from these elements was considerable, and the Danish astronomer made an important change in the practice of observing, by which this trouble was avoided. He used what is called a transit telescope, with a clock, and also a mural quadrant; with these he observed directly the differences between the right-ascensions (in time) and between the declinations of the sun and the planets or the fixed stars. It is right to remark however that Picard had somewhat earlier fixed in the plane of the meridian a telescope, by which he could, it is said, obtain altitudes between 56° and 61°. Now a space equal in extent to five degrees cannot be seen at once in a telescope, and therefore it is probable that this was moveable in altitude to that extent; and if Römer was at any time a witness to the performance of the instrument, he may have taken from it the idea of making a telescope turn on a horizontal axis through 360 degrees in the plane of the meridian. It appears also that De la Hire contended with Römer for the honour of having been the first to fix a quadrantal instrument in that plane.

ROMFORD. [Essex.]

ROMILLY, SIR SAMUEL, was born in London, on the 1st of March, 1757. His grandfather, a French Protestant, was entitled by inheritance to a considerable landed estate at Montpellier, but he quitted France in consequence of the persecutions which succeeded the revocation of the Edict of Nantes, and established himself in the business of a wax-bleacher, in the neighbourhood of London. His youngest son, Peter, the father of Sir Samuel Romilly, was brought up to the trade of a jeweller, in which he became successful and eminent. Of the numerous family of Peter Romilly, two sons and a daughter alone survived their infancy, of whom Samuel was the youngest. The early education of Samuel Romilly was extremely defective. He was sent with his brother to a day-school, frequented by the children of the French refugees in London, the master of which was ignorant and tyrannical, and incompetent to instruct his pupils in anything beyond reading, writing, and the rudiments of the French language. The elder brother being intended for his father's trade, it was attempted to lead Samuel's inclination to the business of a solicitor; but a disgust implanted in his mind by a view of the discouraging apparatus of an attorney's office in the city, caused the abandonment of this scheme. It was then proposed to place him in the commercial house of the Fludyers, who were near relations of his family, and one of whom, Sir Samuel Fludyer, was his godfather. With a view to this employment he received instruction in book-keeping and mercantile accounts, but the death of both the partners in the house of Fludyer put an end to this promising project, and his father, having failed in several other schemes respecting him, eventually employed him in his own trade, at first simply for the purpose of furnishing him with occupation, and afterwards with the intention that the two brothers should succeed to the business in partnership upon their father's retirement.

During the intervals of leisure which were abundantly afforded him for several years after he left school, at the age of fourteen, Samuel Romilly applied himself assiduously to literary studies, which were more suitable to his serious and somewhat melancholy disposition than the usual exercises and amusements of youth. Antient history, English poetry, and works of criticism were at this period his favourite objects of pursuit. When he was between fifteen and sixteen years of age, he determined to become acquainted with the Latin language, and by means of hard study, and with the assistance of a master, he acquired so much proficiency as enabled him, in the course of three or four years, to read through almost all the classical writers of Rome. He also applied himself to Greek, but, discouraged by the difficulties of self-instruction, he abandoned the attempt, and contented himself with studying the Greek authors by means of Latin versions. In addition to classical studies, he read travels, and acquired a competent knowledge of geography, and some acquaintance with natural history; and he also attended private lectures on natural philosophy, and the lectures on painting, architecture, and anatomy delivered at the Royal Academy. Thus, though he had not the opportunity of becoming a scholar in the academical sense of the term, he contrived by his perseverance and unaided efforts to refine his taste, and to lay up in his mind a store of elegant and useful knowledge, which enabled him to proceed in the exalted walk of life to which his fortunes subsequently led him, without experiencing those impediments and mortifications which usually arise from an imperfect education.

It is not surprising that a devotion to such pursuits as these should excite aspirations for an occupation more congenial to them than the trade of a jeweller; and his indulgent father, whose pecuniary means had been about this time increased by considerable legacies to his family, and among them a bequest of 2000*l.* to Samuel Romilly, readily yielded to his son's wishes in this respect, and articled him for five years to one of the sworn clerks in chancery. The mechanical duties of this office, though in some degree enlivened by his master's practice as a solicitor, were scarcely more attractive to Romilly than his attendance upon his father's business; but he devoted his frequent leisure at this period to literary studies, and in particular to strenuous exercises in prose composition. The object of serving a clerkship of this kind was the purchase of a seat in the Six Clerks' Office at the expiration of his articles, and the intended retirement of his master was likely to offer a favourable opportunity for the attainment of this object; but Romilly's dislike to the business, and his disinclination to embarrass his father by withdrawing from his hands the amount of the bequest above mentioned, which would have been necessary in order to purchase the seat, determined him to renounce his prospects in the Six Clerks' Office entirely, and to qualify himself for the bar. Accordingly, in May, 1778, having served his clerkship, and completed his twenty-first year, he entered himself at Gray's Inn, placed himself in the chambers of an equity draughtsman, and commenced with great ardour the study of the law. He still, however, pursued his literary studies and exercises, employing much of his time in reading and translating the Latin historians and orators, occasionally writing political essays for the newspapers, and sometimes attending the houses of parliament for the purpose of exercising his own powers of abstraction, argument, and expression, by composing imaginary answers to the speeches which he had heard there.

Not long after he commenced his legal reading, he was attacked by serious illness, which, aggravated and protracted as it appears to have been by his constitutional disposition to despondency, compelled him to lay aside all severe studies, and threatened wholly to interrupt his professional prospects. Fortunately a family incident induced him to undertake a journey to Switzerland, where he remained several weeks in the society of his brother-in-law and most intimate friend the Rev. John Roget, and, returning by way of Paris, he became acquainted in that capital with D'Alembert and Diderot, and formed intimate friendships with several of the most eminent political philosophers
of that day, whose conversation and correspo
duced a marked effect upon his character and
He arrived in London after an absence of several
with his health entirely restored.

In Easter term, 1783, Romilly was called to t
but his entrance upon the practice of the posses
postponed for several months in consequence of
journey to Switzerland, which he undertook for the
of attending his sister to England, upon the deat
Roget. In Michaelmas term, 1783, however, he b
attendance upon the courts, and opened his practic
very inconsiderable amount of employment in
chancery pleadings. In the following spring he jo
Midland circuit; but being unknown and without
tions of any kind, no encouraging prospect of busi
peared for several years. Success at sessions how
to employment on the circuit; and though his p
by no means rapid, we have his own authority
that when the extent of his practice in the C
Chancery compelled him to restrict himself to
he had attained to a larger amount of leading
business than was possessed by any other counsel u
circuit. (*Memoirs of Sir Samuel Romilly*, vol. i., p

In the year after that in which he was called to
Romilly, through his connections in Paris, became ac
with Mirabeau. By his means he was introduce
late Marquis of Lansdowne, who had become de
his acquaintance upon learning that he was th
of an anonymous tract, entitled 'A Fragment on
stitutional Power and Duties of Juries;' and who,
from the first conceived a high opinion of Romilly'
continued to be for many years his steady friend an
Lord Lansdowne's estimate of his character, and
cipation of his eventual success, are evinced by the
in the first years of their acquaintance, and before
of Romilly's professional fortunes had begun to
was twice offered a seat in parliament by that n
which he declined from a feeling of independen
early introduction of Romilly to the confidence and
friendship of many persons of the highest distin
their station and talents, both in France and
must be considered as an unquestionable proo
eminent merit. A young man barely twenty-six
age, the son of a jeweller, unknown at any publi
or university, and a barrister of only a year's
could have been indebted to nothing but his own
character for his admission into such society, and
esteem and respect with which he was regarded by
riors in rank, age, and reputation, at the very co
ment of his active life.

Soon after his first introduction to Lord Lansdow
tention was directed by that nobleman to Madan's '
on Executive Justice,' a tract now forgotten, but whi
time excited much notice, and is said to have had co
influence with the judges in enforcing the execution
punishment. The author of this tract relied upon
known principle, that as the object of judicial pu
is to deter from crime, the effect of penal laws is i
measure lost unless execution follows the sente
certainty. The principle is true in the abstract; b
absurd to attempt to apply it in practice to laws
as at that time existed in England. In answer to
tract, Romilly published some sensible observatio
anonymous pamphlet, his composition of which
bly the first occasion on which he was induced to
with attention the principles of criminal law.

Romilly's practice, both on the circuit and in t
of Chancery, within ten years after he was calle
bar, became considerable. The precise period at
quitted the circuit is not mentioned in any published
of his life; but it must have been subsequent to
which year he successfully defended at Warwick a
of the London Corresponding Society, prosecuted
government for sedition (*Howell's State Trials*, v
p. 595), and was probably previous to the summe
year 1800, when he was made king's counsel. It is
probable that upon his marriage, which took plac
commencement of 1798, he may have formed th
mination to confine his practice to the Court of Ch

After obtaining rank in the profession as king's
his business in the Court of Chancery rapidly inc
and in 1805, we learn from his own evidence, 'that
barristers who attended the Court of Chancery, he w

st practice.' (*Memoirs*, vol. ii., p. 111.) About
the Bishop of Durham gave him the office of
r of the County Palatine of Durham, which he
iany years. In the autumn of the year 1805 he
l a seat in parliament by the Prince of Wales (after-
rge IV.), who at that time adhered to the Whig
whose attention had been particularly drawn to
rom the circumstance of his being about that time
n a cause in chancery, in which the prince was
rested. This offer was declined from the same inde-
eling which had induced him to decline two offers
ir kind previously made by Lord Lansdowne.

's early association with some of the most distin-
ersons interested in the French revolution, and,
perhaps his intimacy with Mirabeau, had given
outset of life a decided bias towards what are
pular or liberal opinions in politics. In con-
ith his general principles he became a decided
f the Whigs, and, long before he obtained a seat
use of Commons, was in the habit of confidential
ation with the leaders of that party. On the form-
e Grenville administration at the commencement of
06, he received the appointment of solicitor-gene-
e honour of knighthood, and was brought into par-
the government for the borough of Queenborough.
pointed one of the managers for the Commons, on
d impeachment of Lord Melville, and summed
lence in support of the charge. He states in his
he spoke on this occasion for three hours and
nutes (*Memoirs*, vol. ii., p. 139); but from the re-
speech in the printed accounts of the trial, it does
to have been by any means the most successful
isic or parliamentary performances. In truth, the
as most unfortunate; and he undertook the task
atter of inclination, but of duty, conceiving that
tion with respect to the government and the party
h he had taken office, he could not with pro-
ine it. In the course of his first session in par-
e introduced a bill for the amendment of the
laws (46 Geo. III., c. 135), which passed both
very little objection or observation, and consti-
terial improvement of that which was then an ex-
fective branch of the law of England. After the
of parliament, which took place at the close of the
he was re-elected for the government borough of
ugh; and in the early part of 1807, and while in
licitor-general, he introduced a bill for the purpose
real property in all cases assets for the payment
contract debts. This just and reasonable mea-
ugh approved by Lord Ellenborough, was strongly
the House of Commons by the Master of the
William Grant, and rejected by a considerable
The opposition offered to this measure by the
the Rolls was personally resented by Sir Samuel
ith a degree of acrimony scarcely justified by the
measure founded upon a more limited application
e principle, by confining it to the freehold pro-
raders, was, during the next session of parlia-
osed by Romilly, and carried (stat. 47 Geo. III.,
subsequent periods he made several attempts to
roposition into execution to its full extent, but
cess. His reply to the Master of the Rolls in
bate on this bill, and his speech about the same
vour of the abolition of the slave-trade, estab-
reputation as a parliamentary speaker of the
racter.

h, 1807, the Whig ministers were displaced, and
removal ended the short official employment of
He retained, however, his seat in parliament, and
until the end of his life a zealous and leading
the opposition party. On the dissolution of
, which took place after the change of ministers,
ed his return for the borough of Horsham from
of Norfolk—a mode of entering the House of
which he characterised as 'detestable' (*Memoirs*,
01), but which he justified in his own case as
at time the only mode by which he could hope to
at in parliament consistently with that entire in-
e of action which alone made it valuable to him.

of 1807 he opposed the several harsh mea-
were pa sed for the suppression of disturbances
and warmly supported Mr. Whitbread's bill for
g parochial schools; and besides the measures respecting the freehold estates of traders above alluded to, he introduced an important practical improvement in the administration of justice, by abolishing an unfair and useless privilege of members of the House of Commons as defendants in equity.

In the early part of the session of 1808, Sir Samuel Romilly lost his seat in parliament for Horsham upon a petition; but after the interval of about a month, he was returned for the borough of Wareham, having purchased his election for 3000*l.*

In the autumn vacation of 1807, Romilly had applied himself to the consideration of the criminal law of England, with a view to remove some of its glaring evils and defects. His attention had been called to the subject at an earlier period, when he composed his observations on Madan's treatise; and he now found himself in a situation, with respect to influence and authority, which justified the hope that he might be enabled to carry into practical operation the doctrines which experience and reflection, together with his acquaintance with foreign laws and the writings of foreign jurists, had long before impressed upon his mind. The English penal law is founded upon no general principles of jurisprudence, and is arranged upon no system, but consists for the most part of a vast number of positive and disconnected provisions, made at different periods of time, and in totally different states of society, so that the harsh and rugged enactments of a barbarous time have been carried on into a period of civilization, to the manners and institutions of which they are wholly unsuited. Unfortunately too, until very lately, it was the practice of the legislature, in making new provisions for particular exigencies, rather to attempt to equalize punishments, by imitating the severity of the antient laws, than to render them just and consistent by a general revision of the whole system. It was from this cause that, at the time when Sir Samuel Romilly began to apply his mind to the subject, the penal laws of England were far more severe than those of any other European country—nearly 300 crimes of various degrees and qualities of moral guilt being then indiscriminately punishable with death. The necessary consequence was a great uncertainty in the execution of criminal justice, proportionately impairing its effectiveness; for, as Lord Coke long ago observed, 'too severe laws are never duly executed' (3 *Inst.*, 163). To the removal or mitigation of this great evil Sir Samuel Romilly devoted himself with uncommon energy and perseverance during the last ten years of his life. At first his views of practical improvement were limited, and the only measures which he originally contemplated were, first, a provision by which acquitted criminals should be allowed compensation out of some public fund; and, secondly, an enactment raising the amount of the value of property to the stealing of which capital punishment should be annexed. The first of these measures, though just in principle, was liable to many serious difficulties in its application to practice, and being strongly opposed in the House of Commons, was early abandoned, and never afterwards resumed; and the second was modified at the recommendation of the present Lord Abinger, then Mr. Scarlett, who suggested to Romilly, as a much more effectual improvement of the law, the total repeal of all statutes which punish with death mere thefts unaccompanied by any act of violence or other circumstances of aggravation. Though Romilly readily adopted this suggestion, he thought that a proposition for the simultaneous repeal of so large a number of statutes stood no chance of success in parliament, and for that reason he resolved to propose, in detail, the repeal of individual laws, by which punishments of disproportionate severity were enacted, and thus gradually to expunge the whole from the statute book. Accordingly immediately after he had taken his seat for Wareham, in 1808, he brought in a bill to repeal the stat. 8 Eliz., c. 4, which made it a capital offence to steal privately from the person of another; and this measure, after some objection and discussion in the House of Commons, was eventually passed (48 Geo. III., c. 129). His next step towards the attainment of his object was taken in the early part of the session of 1810, when he introduced three bills to repeal several statutes which punished with death the crimes of stealing privately in a shop goods of the value of five shillings, and of stealing to the amount of forty shillings in dwelling-houses or in vessels on navigable rivers; and in order that his views on the subject might be generally understood, he published the substance of the speech delivered by him on his first proposal of the bills, together with some further arguments, in the form of a pamphlet, entitled 'Observations on the Criminal Law as it relates to Capital Punishments, and on the Mode in which it is administered.' One of the bills introduced by him on this occasion was thrown out in the House of Commons by a majority of two voices, in a very thin house; a second reached the House of Lords, and was there thrown out by a large majority—the lord chancellor (Eldon) and Lord Ellenborough using reasons against it which at the present day cannot be perused without astonishment; and the third bill was withdrawn by Romilly, after having in vain attempted to make a house in order to have it read a third time. Notwithstanding this failure, his confidence in the justice of his principles, added to his characteristic firmness and perseverance enabled him, in spite of all the discouragements arising from the apathy of friends, and the ignorance, prejudices, and party-spirit of enemies, to renew his endeavours to pass these measures in each succeeding session during the remainder of his life; but although several severe laws of a local and special nature were repealed, and although a considerable effect was produced on public opinion by the repeated discussions of the subject, it was not until several years after his death that any substantial improvement of the criminal law was effected.

In the anticipation of a dissolution of parliament on occasion of the king's illness, at the latter part of 1811, Sir Samuel Romilly was invited to allow himself to be put in nomination to represent the city of Bristol. Having accepted this invitation, he went down to Bristol upon the dissolution of parliament at the close of the year 1812, with the most encouraging prospect of success; but an opposition was excited in favour of a merchant of Bristol, whose personal influence and local connections gave him a much more efficient interest among the numerous constituency of that city than that which Romilly had acquired by means of his public character. The consequence was, that after a few days' struggle, he abandoned the contest as hopeless. Upon this failure, he was returned by the duke of Norfolk for his borough of Arundel; and Sir Samuel considered that the objections which he had entertained in early life against accepting a seat in parliament from the proprietor of a borough no longer applied, inasmuch as his public character was now so fully established, that he could never be suspected of intending to speak or vote merely at the dictation of his patron; and because, since the law had declared the former practice of selling seats to be illegal, there was no other means of entering the House of Commons than by the nomination of a patron or a popular election.

In the interval between the dissolution of the former parliament and the meeting of the new one in 1813, he published a small pamphlet, entitled 'Objections to the Project of creating a Vice-Chancellor of England.' This unsatisfactory plan of reforming the evils of the Court of Chancery he in all its stages strenuously though unsuccessfully opposed.

It would exceed the proper limits of the present article to relate in detail the circumstances of the parliamentary career of Sir Samuel Romilly during the last five years of his life. In addition to his proposals for the improvement of the criminal law, he took an active part in all the political questions of the time, generally acting in zealous opposition to the ministers. He supported Mr. Whitbread's resolution against declaring war with France upon the return of Napoleon from Elba in 1815: he opposed the bills for suppressing Irish insurrections, and for the suspension of the Habeas Corpus Act in 1817, and moved resolutions condemning Lord Sidmouth's circular to magistrates respecting the prosecution of seditious libels. He also spoke and voted against the Alien Act, and in favour of an extension of the elective franchise, and of Roman Catholic emancipation.

In the summer of 1818 a dissolution of parliament took place, and Romilly, being solicited to appear as a candidate for the representation of Westminster, was returned at the head of the poll, though he declined to take any part in the canvass, and did not appear upon the hustings until the termination of the election. He died however before the meeting of parliament. Lady Romilly, to whom he was devotedly attached, and whose health had been for some months declining, died at Cowes in the Isle of Wight, on the 29th of October, 1818; and this event occurring to a mind already dangerously excited by recent exertions and anxiety, produced a delirium, under the influence of which
he put an end to his existence on the 2nd of N
1818.

In his profession Sir Samuel Romilly attained t
success than has been enjoyed by any advocate
time of Sir Edward Coke. Nor did his profession
tion at all exceed his merits. He had a familiar k
of the principles of English law as administered in
courts of equity, but in common-law tribunals, an
perspicacity of thought and expression, strong pow
soning, great earnestness in enforcing his argumen
devotion to the interests of his client, and singular
in the management of a cause. To these quali
united a deep sonorous voice, and unequalled im
ness of manner. On the other hand, he is related
been stern in his deportment to juniors, and unn
severe in forensic altercation. This may have ari
that contempt for the members of his own p
which, it appears from his diary, was a prevailing
in his mind, and which he expresses in some
without sufficient reason. Being himself far in a
the opinions of his profession, and feeling in his
with the certainty of demonstration the truth of th
ciples upon which he founded his projected impr
of the law, he was too much inclined to treat the
and bigotry which often opposed them with a
proportion of personal acrimony. Although in
letters Romilly occasionally expressed in strong
aversion to his profession, declaring that he 'ever
more unfit for it, and disliked it the more the mo
with success in it' (*Memoirs*, vol. i., p. 454.), the
do not appear to have been the confirmed sentime
mind, and were probably excited by the irksomen
mechanical business with which the practice of a
barrister commences. At a later period, when t
of his practice was different, we do not meet wi
expressions of discontent; and it is hardly p
suppose that his exalted position in the Court of
during the latter years of his life, should not ha
source of just pride and gratification to him. At
the tradition of the profession ascribes to him m
ness, both in acquiring and retaining his practice.

As a politician, Romilly was inflexibly consisten
general views, and uniformly acted up to his prin
displayed however more of the mere spirit of
might have been expected from his enlarged
otherwise independent character. In some insta
cially in the case of Mr. Perceval, he suffered t
of party to interfere with the friendships of privat
with a species of bigotry hardly credible, seemed
it morally wrong that he should associate cordiall
who differed from him in political opinion. The
attachment to party induced a degree of intolera
formly ascribing to corrupt or interested motive
sional desertion of individuals from the Whig stan
sometimes, as in the case of his personal attack
Melville in the debate on Mr. Brand's motion in
him into expressions of rudeness which his own
taste afterwards strongly condemned.

His public speaking was perhaps more deeply
than that of any speaker of modern times. He
himself with great readiness and fluency. Witho
artificial means, and without the use of figurativ
or ornament of any kind, his simple, correct, a
style, supported by his serious and dignified depo
fine voice, often produced an effect equally surpri
speaker and his hearers. Romilly mentions in
an instance of this kind, which occurred in h
speech to the electors of Bristol, in 1812: 'The
thing,' says he, 'in this speech at all calculated to
passions, and I know not to what cause is to be a
effect it produced: but it is certain that before I
conclusion, I saw the tears streaming down the
many of my hearers.' (*Memoirs*, vol. ii., p. 6
writer of this article was present on the occasion b
to, and well remembers the powerful impression
the few simple sentences uttered by Sir Samuel

Romilly's style in writing displays the same
his manner of speaking,—clear, easy, forcible, a
unadorned. In very early life, he acquired the
reading with care and reflection, and of thinking
closely; and hence arose the faculties of accurate
and of distinct and powerful expression, for whi
singularly remarkable.

EY and ROMNEY MARSH. [Kent.]

EY, GEORGE, born at Dalton in Lancashire, r 15, 1734, was the son of John Romney, a wealthy aker of that town. As he showed a mechanical very early age, he was taken away from school in th year, and placed in his father's workshop. A er of the name of Williamson, an eccentric man, devoted to alchemy, exercised an influence over of young Romney which seems to have left a pression; he endeavoured to initiate him in the of his favourite pursuits, and our young painter an unwilling disciple. How Romney first mani- lent for the art in which he subsequently attained nction, is not satisfactorily shown by his several rs. His son the Rev. John Romney states that th Lionardo da Vinci's treatise on painting, em- with various illustrations, at a very early age. to Hayley, he appears to have had a passion for people and taking likenesses, which he exercised g his fellow-workmen in various attitudes upon the boards in his father's workshop. His first effort cted any notice was a drawing of Mrs. Gardiner, luced his father, encouraged by the persuasion of ends, to place him with a portrait-painter of the Steele, who painted heads at Kendal, to whom he l for four years, at the age of nineteen.

ndal, in 1756, Romney contracted an early mar- Mary Abbot of Kirkland, by which he displeased ts; and according to Hayley, although his son fact, he himself shortly afterwards repented of his e step. The result however proved that his choice ntly worthy of his affections. Having cancelled the with his master, Romney, at the age of twenty- mmenced painting on his own account. His first pro- as a hand holding a letter for the post-office win- endal, which continued there for many years. His aits were two half-lengths of Walter Strickland of nd his lady, at whose house he saw a portrait of r Strickland, by Lely, and two portraits, by Rigaud, ictures by other masters that he had any oppor- studying previous to his arrival in London. His vas indefatigable, and nature alone being his guide, ly formed for himself a simple and natural style, ed by those artificial or adventitious qualities so easily acquired from the schools. Through the of his friend Mr. Strickland, he obtained consider- oyment from the gentlemen of Westmoreland, in whose portraits he introduced dogs, painted with t and truth. Besides portraits he painted many es, twenty of which he exhibited in the town-hall l, and disposed of afterwards by lottery, for which eighty tickets at half-a-guinea each. After exer- talents for about five years in the north, his am- ected his views towards the capital; and in the 1762, he set out alone for London, leaving his wo young children in Kendal, who, according to s son, were to join him when he had established he metropolis; but the sequel casts a shade over character of Romney. He rose rapidly to fame e, and, with Reynolds and Gainsborough, divided age of the great and the wealthy; but his young ever called to share the fortunes of her husband; led his marriage from his friends, and only re- the neglected mother of his children when he was eble, and required a nurse to administer to his bear with his weaknesses.

y commenced his metropolitan career by painting four guineas in the city. In 1763 he obtained the ize of fifty guineas from the Society of Arts for a the Death of Wolfe, but through the influence of the decision was revised and reversed in favour of , for his picture of Edward the Confessor seizing ures of his Mother. Romney received a present -five guineas. This circumstance is supposed by ave been the principal cause of the enmity which subsisted between Romney and Reynolds.

y seems to have met with considerable and early ent. He soon moved from the city to the west ed his price for a head to five guineas. At this a short visit to Paris, where he was much struck t Mary de' Medici series of pictures by Rubens, bourg. Upon his return he painted the por- oseph Yates, one of the judges of the court of king's bench, a picture which procured him a valuable connection amongst lawyers. Shortly afterwards he obtained a fifty-guinea premium from the Society of Arts for a picture of the Death of King Edmund.

In 1767, in consequence of his rapidly increasing practice, he removed to Great Newport Street, within a few doors of the former residence of Reynolds. Here he added greatly to his reputation by a portrait of Sir George Warren and his Lady, with a little girl caressing a bullfinch. He now not only ranked with the first painters of fancy subjects, but he bid fair to rival the President in portrait.

Romney's intercourse with men of taste and learning was now such as to make him feel the necessity of an acquaintance with the great works of art upon the Continent. He accordingly set out for Italy in 1773, with a letter of introduction to the pope from that great patron of the arts the duke of Richmond. In Rome he paid particular attention to the works of Michel Angelo and Raphael; and during his stay there produced one of his most beautiful pictures, the Wood Nymph, representing a naked female reposing upon the ground with her back towards the spectator.

From Rome he went to Venice, where he painted the portrait of Wortley Montagu in a Turkish dress. He returned to London in the summer of 1775, greatly improved in every respect by his continental tour.

Shortly after his return to London, he took a house in Cavendish Square, and, under the auspices of the duke of Richmond, recommenced his career as a portrait-painter, charging 15 guineas for a head, 30 for a half-length, and 60 for a whole-length; the president's price being at that time 35 guineas for a head. But Romney soon found it necessary to raise his prices, for sitters of all ranks crowded to his studio; and, notwithstanding they were still comparatively low, in a few years he realised an income of nearly four thousand a year by portraits alone.

He subsequently raised his prices considerably: in 1787, to 25 guineas; in 1789, to 30; and in 1793, to 35 guineas for a head, which continued to be his charge during the remainder of his life, the other sizes being charged in proportion.

Romney was now the acknowledged rival of the President in portrait. Reynolds's admirer and biographer, Northcote, says, 'Certain it is, that Sir Joshua was not much employed in portraits after Romney grew into fashion.' Lord Thurlow is also reported to have said, 'Reynolds and Romney divide the town; I am of the Romney faction.' To characterise these two factions technically, we should term them the factions of form and colour, the former being that of Romney. Romney's great success seems to have excited an active jealousy upon the part of Sir Joshua, who, when he spoke of him, used to term him 'the man in Cavendish Square;' and, from a passage in Northcote's 'Life of Reynolds,' we may infer that the President occasionally spoke disparagingly of the works of Romney. Northcote represents Garrick as saying of Cumberland the dramatist, 'He hates you, Sir Joshua, because you do not admire the painter whom he considers as a second Correggio.' 'Who is that?' said Reynolds. 'Why, his Correggio,' answered Garrick, 'is Romney the painter.'

Notwithstanding Romney's great employment in portraiture, he found abundant leisure to *lay in* fancy pieces, many of which however were left unfinished. The most remarkable of those of the earlier part of his career were, The Tempest; Tragedy and Comedy nursing Shakspere; the Infant Shakspere attended by the Passions; the Alope; Children in a Boat drifted out to Sea; Shepherd Boy asleep, watched by his Dog, at the approach of a Thunder-storm; Nature unveiling herself to Shakspere, &c. Romney is said to have been the originator of Boydell's 'Shakspere Gallery.' The Tempest and the Infant Shakspere attended by the Passions were painted for that collection. He made sketches also for five other subjects, but they were never executed; the Banquet and the Cavern Scene in 'Macbeth;' Mrs. Ford and Mrs. Page; Bolingbroke and Margery Jourdain conjuring up the Fiend; and the Maid of Orleans.

Romney was an enthusiastic admirer of the celebrated Lady Hamilton, then the beautiful Emma Lyon. According to his son, he made no less than twenty-three pictures from her, some of which however were never finished. She was painted in various characters, as Iphigenia, St. Cecilia, Sensibility, a Bacchante, Alope, the Spinstress, Cassandra, Calypso, Magdalene, Joan of Arc, and Pythian Priestess.

Romney's ambition appears to have increased with his years, and in his later days he devoted himself more ardently to fancy subjects than ever. Milton and his Daughters, and Newton making Experiments with the Prism, as a companion to it, were the most popular of these later productions. He sent 100*l.* to Flaxman, then studying in Rome, to purchase casts from the antique for him, who sent him 'the cream of the finest things in Rome.' The group of the Laocoon, the Niobe, the Apollo Belvidere, the Apollo Sauroctonos, groups of the Castor and Pollux, and Cupid and Psyche, the relief on the Borghese vase, several busts, and the best fragments of legs and arms that could be found. These splendid monuments of antient genius tended only still further to excite the emulation and ambition of Romney; he conceived grand designs of painting 'the seven ages,' 'the visions of Adam with the angel,' 'the flood, and the opening of the ark,' and many from Milton, some of Adam and Eve, and others having Satan as their hero.

This constant excitement seems to have been too much for the painter's nerves, and his mind was gradually giving way under it. His observations called forth by the melancholy fate of his friend Cowper seem to have been almost foreboding of the similar fate that awaited himself: 'If there is a situation more deplorable than any other in nature, it is the horrible decline of reason, and the derangement of that power we have been blest with.' The health of his faculties was now rapidly declining, but the return of his friend Flaxman from Rome, of whose talents he had a very high opinion, cheered him for a season. He shortly however became possessed with an idea that his house in Cavendish Square was not sufficiently spacious to admit of the execution of the magnificent designs he had in contemplation, and he accordingly had a house and gallery constructed at Hampstead, upon his own plans and under his own direction. He left Cavendish Square in 1797, after a residence there of twenty-one years, and repaired to his new studio at Hampstead, but not to revel in the dreams of his wild genius, for he was soon oppressed with a degree of nervous dejection that deprived him of all energy. After one or two efforts upon the canvass, he complained of a swimming in the head, and a paralytic numbness in his right hand, and then renounced the pencil for ever.

In the summer of 1799 he was seized with a sudden impulse, and started abruptly for the north, where, in Kendal, his amiable wife still resided, surviving the cold neglect and long estrangement of her husband, and in whom he found an attentive and affectionate nurse, 'who had never been irritated to an act of unkindness or an expression of reproach' by thirty-seven years of absence and neglect, during which long interval he had paid but two visits to the north. The kind attentions of this exemplary woman awakened feelings of intense gratitude in the heart of Romney, and he once again enjoyed real happiness, to which in the long years of his prosperity he had been a total stranger. He gave orders for the sale of his property at Hampstead, and purchased a house at Kendal, where he had resolved to remain. But this bright period was of short duration, for upon the return of his brother, Colonel Romney, from India, which was little more than a year after his arrival at Kendal, he suddenly fell into a state of utter imbecility, and he lingered on for nearly two years, unconscious of existence, until the 15th of November, 1802, when he died, in the sixty-eighth year of his age. He was buried at Dalton, the place of his birth.

In person Romney was tall and strong, 'his features were broad and manly, his hair dark, his eyes large, quick, and discerning.'

Romney attained to greater eminence in two branches of art, history and portrait, than it is the lot of most men to attain in one. According to Flaxman, he surpassed all British painters in poetic dignity of conception; and in portrait he was the acknowledged rival of Sir Joshua Reynolds. His productions in poetic and historic art, finished and unfinished, are extraordinarily numerous, comprising every variety of subject from the illustration of the most simple historical fact, to the endeavour to embody the wildest fictions of the poets. Some of these designs were presented in 1817, by the painter's son, to the university of Cambridge, to be deposited in the Fitzwilliam Museum; and the Cartoons, so much admired by Flaxman, were by the same gentleman presented, in 1823, to the Royal Institution of Liverpool. They consist of eight from the story of Cupid and Psyche, two from that of Orpheus and Eurydice, and
one from each of the following s —Pr
chained, Descent of Odin, Medea, Bu
fant Shakspere, Death of Cordelia, Gl
Atossa's Dream.

The following examples will serve to show how
sively Romney was patronised in portrait:—the I
Richmond, the Duke of Portland, the Duke of
Lord Chancellor Thurlow, Warren Hastings, Cowp
of Chatham, William Pitt, Gibbon, David Hart
Hyde Parker, Lord Melville, Lord Ellenborough, th
bishops of Canterbury, York, and Dublin, Dr. I
Paley, John Wesley, Thomas Paine, Mrs. Fitzherb
Jordan, and Flaxman modelling the bust of Hayley

Romney was not a member of the Royal Acad
he never sent any of his works to its exhibitions.
had several biographers: Cumberland, the dramat
a short account of him; his friend Hayley, the pu
lished an elaborate life, for which Flaxman wrote t
racter of his works; another was afterwards writt
son the Rev. John Romney; and there is an
memoir of him in Allan Cunningham's 'Lives
British Painters,' &c.

The following are extracts from Flaxman's
the works and genius of Romney:—'When
began to paint, he had seen no gallery of pictur
fine productions of antient sculpture: but then
children were his statues, and all objects under the
heaven formed his school of painting.' 'His geniu
strong resemblance to the scenes he was born in:
it partook of the grand and beautiful; and like
the bright sunshine and enchanting prospects of
were occasionally overspread with mist and gloom.
painters have left so many examples in their work
tender and delicate affections; and several of his
breathe a kindred spirit with the Sigismonda of Co
His Cartoons, some of which have unfortunately
were examples of the sublime and terrible; at
perfectly new in English art.' 'His compositions,
of the antient pictures and basso-relievos, told the
by a single group of figures in the front; whilst th
ground is made the simplest possible, rejecting all
sary episode and trivial ornament, either of secondar
or architectural subdivision. In his compositions
holder was forcibly struck by the sentiment at
glance; the gradations and varieties of which h
through several characters, all conceived in an
spirit of dignity and beauty, with a lively expre
nature in all the parts. His heads were various:
were decided and grand; the female lovely; his fig
sembled the antique; the limbs were elegant an
formed; his drapery was well understood.' 'Fe
since the fifteenth century have been able to do so
so many different branches.'

ROMORANTIN. [LOIR ET CHER.]

ROMSEY. [HAMPSHIRE.]

RO'MULUS. The numerous legends about R
the founder of Rome, may be distributed into two
classes. One of these represents him as closely c
with the royal family of Alba, and may be considere
native legend which probably originated among the
themselves, and was almost universally believed
Romans. The second, which connects Romulus with
and the Trojans, is manifestly of Greek origin, and
become current until a comparatively late period
history of Rome. According to the latter story, I
was sometimes described as the son of Aeneas, an
times as his grandson; and while some writers
Romulus alone, others represent him as having a
(Remus), or several brothers. (See the various
tions of this legend, or rather Greek fabrication,
s. v. 'Roma;' Plut., *Romul.*, 2; and Dionys. Hal., i. 73
Niebuhr, i., p. 210, &c.) This story leaves a vacu
history of Rome, which amounts to about three
and a half, that is, from the return of the heroes fro
till the middle of the eighth century before C
various means were devised by antient writers, suc
building of a second, and even of a third Rome, fo
up this gap. But this story, notwithstanding its in
ities, has sometimes been adopted even by Roman
such as Sallust, who states that Rome was founded
jans, under the guidance of Aeneas. The genuine
legend made Romulus and Remus the twin-sons
daughter of the Alban king Procas. The royal hou

later times represented as descended from Aeneas, thers, preserving the legend more in its original made no mention of its Trojan descent. The main of the Roman legend which are preserved in Livy .; Cic., *De Republ.*, ii. 5; comp. Plut., *Romul.*, 3, ionys. Hal., i., p. 61, &c.), are these:—

Procas. king of Alba, died, he left two sons, Nu- d Amulius. The latter wrested the government r brother, who yielded without a struggle, and private person in quiet retirement. But Amulius, that the descendants of his brother might punish his usurpation, had the son of Numitor murdered, de his daughter Silvia a priestess of Vesta, an office bliged her to perpetual celibacy. One day however ilvia went into the sacred grove to draw water from for the service of Vesta, an eclipse of the sun took nd the maid, frightened by the appearance of a wolf, a cave. Here she was overpowered by Mars, who d her a glorious offspring. She was delivered of ut the god apparently forsook her, for she was con- and put to death by Amulius, and it was deter- that the two children should be drowned in the nio. But the river carried the cradle, with the in it, into the Tiber, which at the time had over- its banks. The cradle was driven into shallow a wild fig-tree (Ficus Ruminalis) at the foot of the hill. A she-wolf, which came to the water to drink, e cries of the children, and suckled them, whilst a ker, which was, like the wolf, an animal sacred to ought them other food whenever they wanted it. rvellous spectacle was observed by Faustulus, the n of the flocks of king Amulius, and he took the and carried them to his wife Acca Laurentia or Thus they grew up in the shepherd's straw huts on tine; that in which Romulus was said to have lived t up to the time of the emperor Nero. The two ecame the stoutest and bravest among their com- ith whom they shared their booty. The followers ulus were called Quinctilii, and those of Remus, A quarrel one day broke out between the two and the shepherds of the wealthy Numitor. Remus n by a stratagem, and led to Alba before Numitor, uck by his appearance and the circumstance of the the two brothers, ordered Romulus likewise to be before him. Faustulus now disclosed to the young secret of their birth, and with the assistance of the comrades who had accompanied them to Alba, they nulius, and their grandfather Numitor was restored overnment of Alba.

ove of their humble home however drew the youths the banks of the Tiber, to found a new city. The assigned to them for this purpose by Numitor ex- in the direction of Alba as far as the sixth milestone, as the frontier of the original *Ager Romanus*, and down to a very late period, the Ambarvalia were zed. A dispute arising between the brothers as to and name of the new city, it was agreed that it be decided by augury. Romulus took his station on atine, and Remus on the Aventine. Remus had t augury, and saw six vultures, but Romulus saw Considering that his double number was a signal f the favour of the gods, Romulus and his party the victory. In observance of the rites customary the Etruscans in the building of towns, Romulus bullock and a heifer to a plough and drew a furrow he foot of the Palatine hill to mark the course of the nd of the pomerium. Over the parts where he in- to build the gates (portæ), he carried (portare) the . The new city thus built on the Palatine was Roma. Remus, who felt indignant at the wrong he had suffered, in order to show his contempt of the nd simple fortifications, leaped over them; and Ro- punished his brother's insolence by putting him to

population of the new city being very small, the thrown open to strangers. Exiles, robbers, run- es, and criminals flocked to the city as an asylum, d a welcome reception. The only thing they now was women; but none of the neighbouring people illing to form matrimonial connections with the new . Romulus therefore had recourse to a stratagem; laimed that festive solemnities and games should be the city, and he invited his neighbours the Latins and Sabines to attend them with their daughters. In the midst of the solemnities the females were forcibly carried off: the number thus taken was said to have been thirty. The three nearest Latin towns, Antemnæ, Cænina, and Crustumerium, now took up arms against Rome, but Romulus defeated them successively, and having slain Acron, king of Cænina, he dedicated the first spolia opima to Jupiter Feretrius. The Sabines, under their king Titus Tatius, likewise made war upon Rome, and the treachery of Tarpeia, a Roman woman, opened to them the gates of the fortress on the Capitol. The Sabines attempted to storm the city, and Romulus in this emergency vowed a temple to Jupiter Stator, in order to inspire his men with courage and to prevent them from flying before the enemy. The war was continued with doubtful success, and finally terminated by the Sabine women throwing themselves between the combatants, and thus restoring peace between their fathers and husbands. Romulus rewarded the women of Rome for their services by the grant of various privileges, and the thirty curiæ were called after the names of the thirty Sabine women. The two nations, the Romans on the Palatine, and the Sabines on the Capitoline and the Quirinal, were united as one nation, though each continued to have its own king.

The two kings and the citizens of the two states met in the valley between the Capitoline and Palatine (comitium) whenever it was necessary to transact business which was of importance to both nations. This union however did not last long, for Tatius was killed during a national sacrifice at Lavinium, and Romulus henceforth ruled alone over the two nations.

During the period that Romulus was sole king, he is said to have carried on two wars, one against Fidenae, and another against Veii. Fidenæ commenced the war from fear of the growing strength of its neighbour; but Romulus got a victory over them by stratagem, and took possession of their town. The war against Veii rose out of that against Fidenæ, for both were Etruscan towns. Veii was likewise humbled, but it obtained a truce of one hundred years, after surrendering part of its territory to Rome.

Such are the fortunes and achievements which the old Roman legend ascribed to the founder of the city. Respecting his political institutions, see the article Rome. He is said to have died after a reign of thirty-seven years (716 B.C.). His death is represented in as marvellous a light as his birth. On the nones of Quinctilis, or on the Quirinalia, the king, while reviewing his people near the marsh of Capra, was taken up by his father Mars, and carried to heaven. The people in terror fled from the spot; but Romulus soon afterwards appeared as a glorified hero to Proculus Julius, and bade him inform his people that in future he would watch over them as the god Quirinus.

Such are the main features of the story of the founder o Rome, which was handed down by tradition, and commemorated in national songs to the time of Dionysius. (Dionys. Hal., i., p. 66.) Writers both antient and modern have attempted to elicit historical truth from this beautiful and in most parts truly poetical legend, or have struck out some parts of the narrative as altogether fabulous, and retained others which are more in accordance with the events of real history. The mischievous results of such perverse criticism have been clearly shown by Niebuhr (i., p. 235, &c.). The acts and institutions attributed to Romulus which are of any importance to the historian, and which from their connection with events of a more historical age, or with the general state of the nations of Italy, may be considered as history, are given in the article Rome.

RONCESVALLES (French, *Roncevaux*) is the name of a valley formed by the Pyrenees of Navarre between Pampeluna and St. Jean Pié de Port, on the French frontier. It is also the name of a small village in that valley, remarkable only for an antient abbey (Nuestra Señora de Roncesvalles), where the tomb of Don Sancho el Fuerte (the strong), king of Navarre, is shown, as well as several antient relics bearing the name of Roland. According to tradition, this hero, and many others of Charlemagne's peers, who had invaded Spain in 778, whilst attempting to regain France, were surrounded by the Navarrese, commanded by Bernardo del Carpio, and put to death. This event however, which forms the subject of many Spanish romances and chivalrous chronicles, is far from being supported by historical evidence.

RONDA, a city in the south of Spain, formerly belonging to the province of Malaga, is now the capital of a province so called since the late division of the Spanish territory. It is generally supposed, though erroneously, to occupy the site of the antient Arunda (Plin., iii. 1), which stood some miles to the south-west. It is an ascertained fact that it was entirely built by the Moors, with the remains of Acinippo, or Ronda la Vieja (old Ronda), which is two leagues to the north, and where the ruins of an amphitheatre, a temple, aqueduct, and extensive walls are still standing. Ronda is situated in the midst of the lofty mountains of the Sierra de Ronda, and is fourteen leagues from Gibraltar, twenty from Cadiz, and about the same distance from Seville. It is considerably elevated above the sea, being built on a hill, which terminates abruptly just below it to the west. The city is separated into two parts by a very narrow ravine of great depth, called El Tajo (the cut), through which flows the river Guadiaro. Though divided by nature, the city has been united by means of a bridge of most stupendous dimensions, springing from the banks of the river on massive stone piers, and at the height of nearly 400 feet above the bed of the river.

The city of Ronda has a population of about 20,000 inhabitants. The streets are narrow, but clean. There is a public walk, called Alameda, well shaded with trees and shrubs; and a Plaza de Toros (bull-ring), built entirely of stone, and capable of holding eight or nine thousand persons. The Alcazar, or Moorish castle, one of the most extensive and best built in all Andalusia, is now a mass of ruins, having been blown up by the French on their evacuation of Ronda during the Peninsular war. It was considered impregnable as long as the Moors held it, and resisted several sieges, until it was finally reduced by Ferdinand in 1485, towards the close of the Moorish war. [MOORS.] With the exception of a few tan-yards, which are not in a very prosperous condition, Ronda has no trade whatever; the inhabitants occupy themselves chiefly in farming and raising fruits and vegetables for the consumption of Gibraltar. An annual fair, originally instituted for the sale of horses, but which now is not confined to that traffic, is held at Ronda. It is attended by merchants from almost every part of southern Spain.

RONDEAU (Fr.), or RONDO (It.), a kind of air consisting of two or more strains, in which, after finishing the second strain, the first is repeated, and again after the third, &c., always returning to and concluding with the first. (Rousseau.)

RONDELE'TIA, a genus of plants of the natural family of Rubiaceæ, named after Rondelet, a French botanist of the sixteenth century. It is characterised by having a calyx with a subglobular tube. Corol superior, funnel-shaped, ventricose at the throat. Segments four to five, ovate, obtuse, spreading. Anthers four to five, sessile within the corol. Ovary two-celled. Style filiform. Stigma bifid. Capsule round, crowned with the limb of the calyx. Seeds minute, numerous, or few when abortive. The genus, as formerly constituted, included many shrubby trees which occur in India (Roxb., *Fl. Indica*), but these have been referred by modern botanists to Adenosacme, Greenia, and Wendlandia. The present genus Rondeletia occurs chiefly in America and the West Indies.

RÖNGEBIRGE. [GERMANY.]

RONSA'RD, PIERRE DE, born in 1524, in the district of old France called Vendômois, was the son of a maître-d'hôtel of Francis I., who made him a knight. Pierre studied for a short time in the college of Navarre at Paris, but soon after he entered the service of the duke of Orléans, son of Francis I., in the quality of page. He afterwards attended, in the same capacity, James Stuart, king of Scotland, who had come to Paris to marry Marie de Lorraine, and he accompanied James on his return to Scotland, where he remained three years. On his return to France he resumed his post with the duke of Orléans, who sent him on several missions to Scotland, Ireland, and other countries. He was afterwards sent by Francis I. on a mission to Piedmont. In these several journeys he suffered much, in consequence of which he became deaf. On withdrawing from active life he retired to the college of Coqueret, where he studied the classics under Turnèbe, became a good Greek scholar, and took orders as a priest. He also began writing French poems, and was crowned in the floral games at Toulouse. [CLEMENCE, ISAURE.] He was considered as the successor of Marot, and the chief of the French poets of the time. [MAROT.] Montaigne, De Thou, Scaliger, Muret, Pasquier, and others commended him highly; but modern critics have judged him more severely. Boileau says that Ronsard's language was a heterogeneous compound of various languages and dialects, and that his muse spoke Greek and Latin in French verses. Malherbe and La Bruyère have spoken of him in the same strain. Charles IX. bestowed on Ronsard an abbacy and other benefices. His moral conduct however is said not to have been strictly clerical. He died in 1585, in one of his livings near Tours, and a solemn funeral service was celebrated in honour of him at Paris, in the chapel of the college of Boncour. Ronsard had certainly poetical genius, but he was deficient in taste. He was in this respect in France what the seicentisti of the following century were in Italy and Spain. His poetical works are numerous; they consist of odes, hymns, eclogues, &c.: 'Mascarades, Combats, et Cartels faits à Paris et au Carnaval de Fontainebleau.' He also began a poem, 'La Franciade,' which he left unfinished. His works are now nearly forgotten. The most complete edition of them is that by Richelet, 2 vols. fol., Paris, 1623.

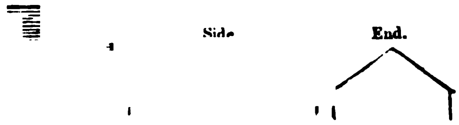
ROOD, the quarter of an acre. [ACRE.]

ROOF, the covering of a house or other building. The name, in its most extended sense, embraces the external covering itself, and the framework by which it is supported; but, as a term in carpentry, it is limited to the carcass roof or framing.

The importance of this part of a building can hardly be overrated, since on its right construction depends not only the comfort of those for whose shelter it is designed, but also the safety and durability of the edifice itself. For the former of these purposes it is desirable that a roof should exclude extremes of heat and cold, and be impervious to rain or snow. For the latter, the exclusion of water is equally necessary, and it is essential that the framework be so disposed as to throw the least possible strain on the By a judicious arrangement in this particular, a roof may not only be prevented from pressing on the walls in an injurious manner, but may be made to contribute greatly to the stability of the whole structure. In order to the due combination of the requisite qualities, an intimate acquaintance with the principles of mechanical philosophy is indispensable: and a correct knowledge of the strength of different materials, when exposed to various kinds of strain, is necessary to the economical adjustment of the dimensions of the several parts of a roof. A roof of large span forms, indeed, one of the most interesting applications of the science of carpentry, theoretical or constructive.

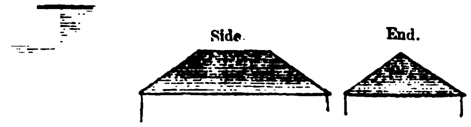
In order to cover in a building in which the space to be spanned is greater than can be covered by single blocks of stone extending from one point of support to another, it is necessary either to have recourse to the principle of the arch, as in vaults and domes of stone or brick, or to form a framework of timber to support the covering. The former plan is objectionable in the case of ordinary buildings from its expense and weight, and from the great solidity required in the walls, where they have to be used as the abu of an arch. The principles on which such coverings of masonry are formed are explained under ARCH and DOME, and in this article the more usual kind of roof, that sustained by a wooden framing, will be described. Such structures occasionally partake of the character of an arch or dome, but more usually consist of flat planes variously disposed. Roofs formed of one level plane, which are extensively used in eastern countries, are not adapted for buildings in which a large space has to be spanned over, nor to resist the penetration of water; and are therefore unsuitable for climates in which rain and snow are common. A simple inclined plane is well adapted to resist injury from weather, but, as it is scarcely more favourable to an economical disposition of the timbers than a flat roof, it is only suited for small buildings, and is seldom used except as a lean-to. Another objection to its use on a large scale is the disproportionate height it requires in one side of the building. The best figure for a single roof is that formed of two inclined planes rising from the two opposite walls that approach nearest to each other, and meeting over the centre of the edifice, so as to form a ridge. By this form, supposing the same slope to be maintained, one half of the height of the single inclined plane is avoided; and, the length of the timbers being diminished one half, their scantling may be considerably reduced. *Fig.* 1 represents a plan, with side and end views of such a roof, which is called a *common* or *gable-ended roof*

Fig. 1.



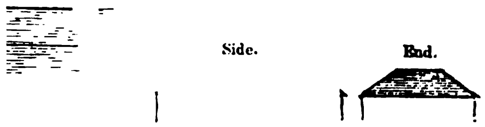
ıtly four inclined planes are used, disposed as shown , representing a *hipped roof*, which takes its name › hips, or inclined ridges formed by the meeting of

Fig. 2.



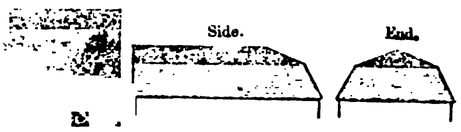
s and ends. Where a hipped roof covers a perfectly ›uilding, the faces all meet in a point, and form a ; but when, as in the diagram, the plan of the roof ;, the planes rising from the nearest opposite walls a ridge. Sometimes the inclined faces are not conpwards till they meet, but the roof is completed by ›ntal plane. Such a roof is called a *truncated*, or *cut roof*, and may have two, three, or four inces. *Fig.* 3 represents a truncated roof hipped at , and terminating at the other in a vertical wall, gable-ended roof.

Fig. 3.



rrangement is useful in diminishing the height of a level platform being covered with lead to compenhe want of slope. It should be observed however n this part is not perfectly level, the centre being ›levated to throw off water. A similar saving of › frequently obtained by means of a roof in which ing face consists of two planes of different degrees of ›n. This form, which is denominated a *curb roof* its inventor, a *Mansarde roof*), is very common in because it affords more space for the formation of s in the roof than the simpler forms. A curb roof hipped or not, according to circumstances. *Fig.* 4 ts it hipped at one end only, as the last figure, showthe previous diagrams, the plan, and side and end .s.

Fig. 4.



are the principal forms of roof used in covering ›ctangular buildings, but they require many modito suit irregularities of shape, or combinations of lar forms. Thus in *Figs.* 5 and 6, which represent :ion of different roofs or portions of roofing at right ‹ith each other, the lines *a a a* indicate *valleys*,

. 5.

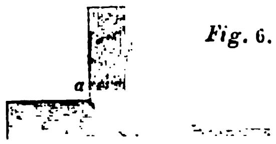


Fig. 6.

;unction of two planes in such a manner as to llows the reverse of hips. When two faces of a so as to form an angle similar to a valley, but in an al instead of an inclined position, the term *gutter* is of valley.

ı distinction, which it may be well to mention beupon the details of construction, is that between roofs with dripping eaves, and those in which the water is collected in gutters. In the former case the roof projects several inches, or even feet, beyond the walls, and the water running from the roof either drops at once on the ground, or is collected in troughs fixed under the margin of the eaves, and conducted by them to descending pipes. This arrangement has a clumsy appearance, and is perhaps unnecessary where a sufficient projection is given to the eaves, though it is essential to the dryness of the walls when they are of the diminutive size often adopted by modern builders. In gutter roofs the timbers do not extend to the outside of the walls, which are carried up as parapets, of a reduced thickness, to such a height as to conceal the roof either wholly or partially. The gutters, which are troughs of wood covered with lead or other metal, are laid at the bottom of the slopes, just within the parapets, and have a gentle inclination (usually about an inch in ten feet), to cause water to run freely towards the pipes. In extensive roofs it is well to use two or more falls instead of one, that the elevated end of the gutter may cover as little of the roof as need be. Similar troughs are often used in the valleys. Gutters are generally made wide enough for a man to walk along them, and should be sufficiently capacious to avoid all risk of overflowing during a sudden heavy fall of rain.

The degree of slope given to the inclined faces of a roof varies according to the covering material employed, as well as to the climate. The antient Grecian temples had very low, or pediment roofs, varying from about 12° to about 16°, the height being from one-ninth to one-seventh of the span. In Roman buildings the inclination is somewhat greater, being usually 23° or 24°, or from one-fifth to two-ninths of the span. The general introduction of the pointed style of architecture led to the use of very high-pitched roofs, a very common proportion being that in which the length of the rafters is the same as the span, so that they formed an equilateral triangle. In comparatively modern domestic architecture in this country, it has been considered desirable for the length of the rafters to be three-fourths that of the span, and an angle of 45° is still considered by some to be the best pitch when plain tiles are used. As builders can, in the present day, obtain excellent covering materials, the pitch may be made of any required degree, down to the low Grecian pediment, and it therefore depends on the style of architecture and the taste of the builder; the most common height being from one-fourth to one-third of the span. High roofs discharge rain the most rapidly, and do not retain snow so much as those of low pitch; but where they have gutters they are liable to become choked by snow sliding into them, and to overflow from water running into them faster than the pipes can convey it away. Steep roofs may be covered with small slates, and are less likely to be stripped by violent winds. Low roofs, in consequence of their superior lightness, are less expensive, the timbers not only being shorter, but of proportionately smaller scantling, and they press less injuriously on the walls. The following table, extracted from Tredgold's 'Elementary Principles of Carpentry,' shows the proper angle for roofs covered with the materials specified in the first column, the last column indicating the comparative weight of each kind of covering:—

Covering.	Inclination to the horizon.	Height of roof in parts of the span.	Weight upon a square of roofing.*
Copper or lead ...	3° 50′	$\frac{1}{48}$	copper 100 lead... 700
Slates, large	22°	$\frac{1}{5}$	1120
Ditto, ordinary ...	26° 33′	$\frac{1}{4}$	900 to 500
Stone slate	29° 41′	$\frac{2}{7}$	2380
Plain tiles	29° 41′	$\frac{2}{7}$	1780
Pan-tiles	24°	$\frac{2}{9}$	650
Thatch of straw, reeds, or heath..	45°	$\frac{1}{2}$	. . . .

In describing the timber-work of an ordinary roof, each of the planes of which it is composed may be considered to be bounded by a frame, the parts of which have the general name of bordering pieces. Those which join the wall are the *wall-plates*; that at the meeting of two faces, parallel to the wall-plates, is the *ridge-piece*; and the inclined bars extending from the wall-plates to the ridge-piece are *rafters*, those which form the salient angles in hipped roofs being distinguished as *hip-rafters*. The support necessary for the external covering is given by a series of rafters or inclined bars, extending from the wall-plates to the ridge-piece, and placed parallel with each other at equal distances. In a hipped roof, the rafters near the ends, being parallel with the others, are necessarily diminished in length, extending from the wall-plate to the hip-rafter instead of the ridge-piece. All such pieces, being shorter than the length between the wall-plate and the ridge-piece, are called *jack rafters*.

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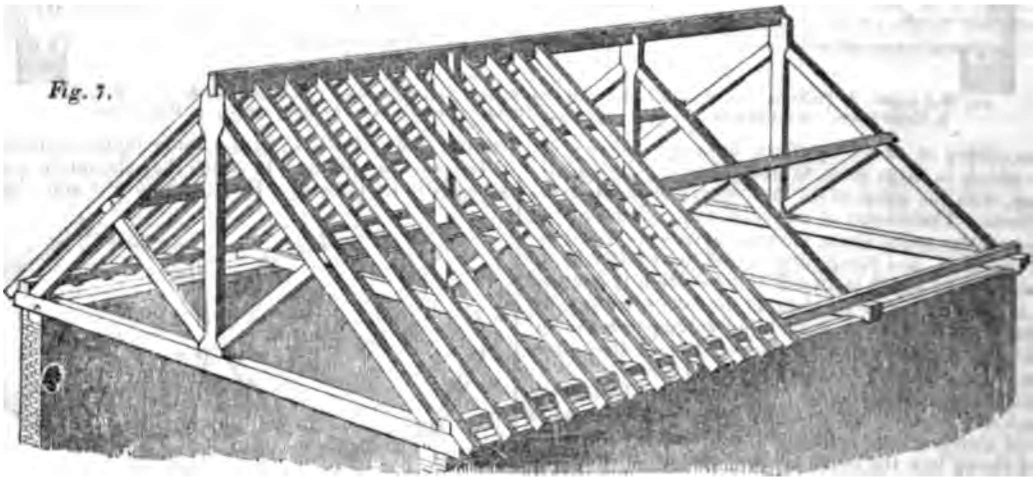
* A square of roofing contains 100 square feet.

It is not usual to vary the scantling, or transverse dimensions of rafters, in any considerable degree, on account of their various lengths; nearly the same scantling being used in all buildings, and the required strength being obtained by introducing intermediate supports between the wall-plates and ridge-piece where the size of the roof renders such necessary. This additional support is supplied by horizontal rectangular bars called *purlins*, placed under the rafters in such a manner as to divide their length into two or more equal parts, the ends of the purlins being fixed to the sides of the bordering frame. Like the rafters, the purlins are not much varied in thickness according to the strain upon them, but they are in turn supported by a series of bars placed equidistant from each other, and parallel with the rafters, but with their upper face in the same plane as the lower face of the purlins. These are called *principal rafters*, or, for brevity, *principals*, to distinguish them from the first described, or *common rafters*. Where it is desirable to save room by reducing the thickness of a roof, the purlins may, as shown in *fig*. 15, be notched into the principals and common rafters, but this practice is not to be recommended, as it weakens the timbers. Where principals are used, their lower ends are mortised into the ends of a *tie-beam*, which stretches across the building, and rests upon the wall-plates. This beam keeps the lower extremities of the principals from separating, and discharges the weight of the roof on the walls in a vertical direction, relieving them entirely from the lateral thrust of the rafters. The triangular frame formed by the two principals and a tie-beam, with any bars it may comprise for additional strength, is called a *truss*, and such frames being placed at regular intervals, the timber-work between any two of them is called a *bay of roofing*. The lower extremities of the common rafters, being elevated by this arrangement above the wall-plates, are supported by *pole-plates*, or pieces of timber parallel to the wall plates, resting on the ends of the tie-beams. The supporting frame-work altogether is called a *carcass-roof*.

Fig. 7, which represents a small carcass-roof supported by four trusses, and having one purlin only between the wall-plate and ridge piece, may assist the reader in comprehending the arrangement of the parts enumerated: and their names will be found more distinctly by referring to the representation of a more complicated truss at *fig*. 11.

Fig. 7.



In this figure the common rafters are represented on one half of the roof only, that the trusses may be more distinctly seen; and the end walls are omitted for the same reason.

The proper construction of the trusses of a roof, with reference to the size of the building and the weight of the covering, is a matter requiring much scientific knowledge. For the want of this it is not unusual to encumber trusses with much more timber than is necessary or useful; and the disadvantage of this is not confined to the increased weight and cost of the roof, as superabundant timbers frequently occasion injurious strains, and the increased number of joints adds to the risk of derangement by the shrinking and warping common to all timber constructions. The general principles to be acted upon may be illustrated by a few diagrams; but in the limited space devoted to this article no attempt can be made to describe all the modifications required by the ever-varying forms of buildings; in the design of which it is too common, instead of assigning its due importance to the roof, to treat it as an unsightly feature, to be concealed as much as possible from view.

In a roof formed as shown in *fig*. 8, consisting simply of two inclined planes abutting on the walls, it is evident that the weight of the rafters *ab* and *bc*, as well as that of the covering sustained by them, will have a tendency to thrust out the walls. This tendency ordinary walls have not the

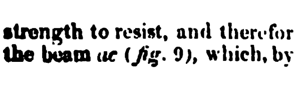


Fig. 8.

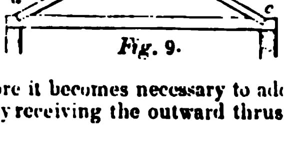
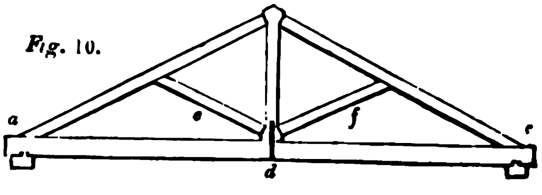


Fig. 9.

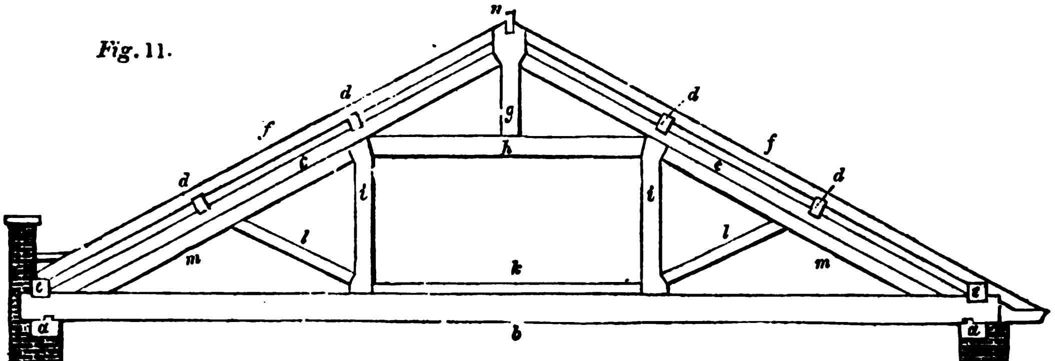
strength to resist, and therefore it becomes necessary to add the beam *ac* (*fig*. 9), which, by receiving the outward thrust of the rafters, relieves the walls of lateral strain. If the tension of the tie-beam *ac* be sufficient to resist the extending force of the rafters without sensible elongation, the only effect that such a roof can have upon the walls is a vertical pressure on each, equal to half its weight: and it cannot fall without the tie-beam, which acts the part of a cord or chain, being pulled asunder, or the rafters being crushed. If the materials were perfectly rigid, no additional parts would be required; but as they are not so in practice, it becomes necessary, when the timbers are of considerable length, to provide means for counteracting their tendency to sinking, or *sagging*. By adding a bar shaped like *bd* (*fig*. 10), the centre of the tie-beam may be suspended from the crown of the roof. This piece is called a *king-post*, but the name is perhaps not a good one, as, though it appears like a post to support the ridge or crown of the roof, it is in reality a *tie*, supported by it, and sustaining, instead of resting upon, the centre of the tie-beam. By cutting the king-post out of a piece of wood of larger scantling than the shank of the post itself, projections of the shape indicated in the cut may be formed at its ends. These are called *joggles*, and those at the upper end form a wedge between the heads of the rafters, like the key-stone of an arch. It is evident that a weight pressing on the projecting joggles at the base of the king-post will be by it transmitted to the

Fig. 10.



n of the roof. These therefore form fixed points, from h support may be obtained, by means of *struts* or , *e* and *f*, for the centre of each rafter. Where pur-re added, they rest on those points of the principal that are thus supported by struts, as may be seen by ce to *fig.* 7. It may be observed that this truss con-us two pieces (the tie-beam and king-post) in a state of on, and four (the two rafters and the two struts) in a of compression; and that in every well-contrived however the number of its component parts may be sed, every bar is in one or other of these states. Those which are in a state of tension, acting merely as cords the truss together, may be and sometimes are formed of slender rods of wrought-iron; but the others, needing stiffness as well as cohesion, require bars of considerable substance, and are therefore mostly formed of wood or cast-iron. Sometimes the king-post is dispensed with, and its office performed by two similar posts, called *queen-posts*, at equal distances from the centre of the truss. In order to keep these in their right position, a short horizontal beam, called a *collar-beam*, is inserted between their upper extremities, and another, termed a *straining-sill*, between their lower ends. This arrangement is explained by *fig.* 11, which also shows the position of other parts of a truss. One side is represented as a gutter-roof, and the other with eaves.

Fig. 11.

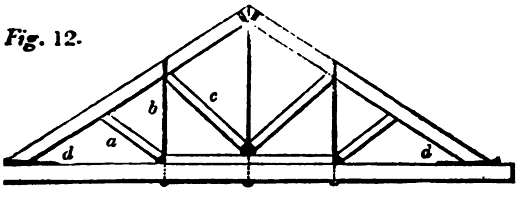


a a, Wall-plates. *b*, Tie-beam. *c c*, Principal rafters. *d d d d*, Purlins. *e e*, Pole-plates. *f f*, Common rafters. *g*, King post. *h*, Collar-beam. *i i*, Queen-posts. *k*, Straining-sill. *l l*, Struts or braces. *m m*, Auxiliary rafters. *n*, Ridge-piece.

ie *auxiliary* or *cushion rafters*, *m*, *m*, are pieces occa-lly added, in large roofs, to strengthen the principals; they, with the collar-beam, &c., form a complete truss n them. The trusses of truncated roofs are formed in nanner, the collar-beam forming, as it were, the key-of the arch, and being surmounted by a *camber-beam*, pper edge of which is formed into two slightly inclined s, to give the necessary slope to the lead covering. In a roof, pieces of wood resembling ridge-pieces are in-l at the angles formed by the meeting of the rafters the horizontal bars that support the flat.

e following representation of a very simple truss, from olson's 'Carpenter and Joiner's Companion,' illustrates se of slender king-posts and queen-posts of wrought-and shows how the stress of every part of the roof may ought to bear on the ridge. The lower ends of the struts n stirrups attached to the vertical rods, and the weight

Fig. 12.



ng on the strut *a* is imparted, through *b* and *c*, to the -post. The tie-beam is suspended by bolts from each vertical rods, and the ends of the rafters are secured e tie-beam by iron straps passing round them, and d to the beam at *d*, *d*. Trusses on the same principle be made of timber only.

curb roofs the upper rows of rafters are called *curb-rs*, and the horizontal bars that receive the upper ends lower rafters, and the feet of the curb-rafters, are n as *curb-plates*. The proper position of equilibrium he rafters of a curb-roof may be ascertained by very le means, within the reach of persons not possessed of cient mathematical knowledge for determining it by lation. If the rafters are to be equally loaded, as in a entirely covered with one material, this position will be tly the reverse of that which they would take by gravity, they suspended in a chain or festoon, the joints being . If they are framed together in this position of urium, they will balance each other like the stones of rch and the tie-beams, posts, and braces will have no e to perform than that of resisting such irregular s might tend to alter their arrangement. The thus suspended would fall into the position *a b c d e*, , a line drawn through the angles being a catenarian curve; and $a' b' c' d' e'$, in the same figure, represents the corresponding position in which they should be placed in an equally loaded roof. If the rafters $b' c'$ and $c' d'$ are to

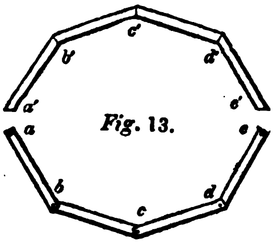


Fig. 13.

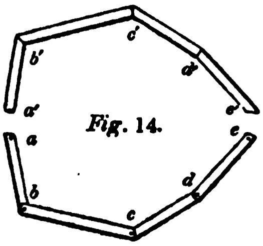


Fig. 14.

bear a greater weight than $a' b'$ and $d' e'$, they will, if proportionately loaded when suspended in a curve, fall in such a way as to increase the angles *a b c* and *c d e*, and diminish *b c d*, thereby indicating their proper position in the roof. When the roof is to be loaded unequally, and more on one side of the ridge than the other, as it would be if $b' c'$ were to be covered with lead, and the other planes with slates, a corresponding weight added to the centre of gravity of *b c* will cause the bars to arrange themselves as *a b c d e*, *fig.* 14, the angles of which, being transferred to the roof, give the position of equilibrium $a' b' c' d' e'$. This practical method of finding the proper angles of a curb-roof may be applied under all circumstances, the dimensions of the experimental bars being proportionate to those of the rafters, and their centres of gravity being loaded according to the pressure to be sustained by each plane of the roof. The great advantage of curb-roofs consists in the space they afford for chambers in the roof, such chambers being lighted by dormer windows in the lower inclined faces. When the trusses of the roof form partitions between the bed-rooms, their posts and braces are so arranged as to leave one or more doorways for communication between them.

In roofs of very large span it is often desirable, in order to avoid running up to a great height, to form two or more ridges. When intermediate support can be obtained from partition walls, such constructions may be regarded as combinations of two or more distinct roofs placed side by side. *Fig.* 15 is an example of a roof of large span without any intermediate support, and having a large available space between the tie and collar beams. It represents the form of the trusses, which were placed fifteen feet apart, of a roof of eighty feet span, erected over Drury-Lane Theatre in 1793.

It is sometimes necessary, in order to obtain additional height inside a building, to raise the tie-beam above the

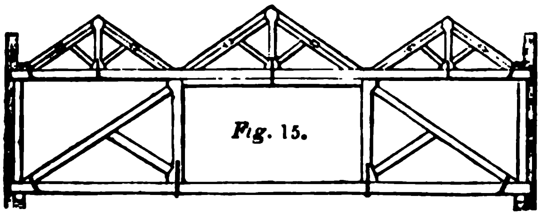


Fig. 15.

level of the top of the walls. In small spans this may be done by the simple arrangement called the *carpenter's boast* (A, *Fig.* 16), in which a firm union is effected between the beam and the rafters without the use of nails or pins. Such a roof can only press injuriously on the walls by the rafters sinking into a concave form, which however their lower ends are very liable to do. In such a case additional strength may be obtained by inserting a longitudinal truss, as in B, *Fig.* 16, where *c* represents the end of the truss, which should be firmly built into the gables. *d* and *e* are side views of two longitudinal trusses suitable for such a situation, the first being stiffened by an arch of iron notched into the short vertical pieces, and the second formed of timber only. Similar trusses are occasionally introduced under the purlins. Roofs without ties may be greatly strengthened by the use of parabolic curves of iron, notched into the rafters of each inclined face, and abutting on the wall-plates, which in such a case are firmly bolted together. The timbers of such a roof may be framed together in planes, each having a distinct ridge-piece, and the ridges being screwed or otherwise firmly connected together. The curves may be cast in short segments, as they are compressed when in use, it being merely necessary to provide that the joints should always abut on a rafter. Tredgold, in his 'Elementary Principles of Carpentry,' recommends the use of similar curves, of either wood or iron, in the trusses of an ordinary roof, by which the derangement often arising from the shrinking of the king-posts and queen-posts may be avoided. In this case the curves take the place of the principal rafters, and, if made of wood, may be constructed of short straight pieces, arranged as shown in *Fig.* 17, and held together by bolts or wooden keys. When curved timber can be obtained it is to be preferred, as it reduces the number of joints. For small roofs timbers may be bent into the required form, as it is found that a piece of wood the thickness of which does not exceed $\frac{1}{50}$th part of its length, may be bent into a curve rising one-eighth of its span without impairing its elasticity. Two such pieces may be laid together, and bent by twisting a rope attached to their ends, as is done in tightening the frame of a bow or pit saw; and, being bolted together while curved, they will spring back but little when the rope is relaxed. Another mode of forming such a rib is to take a piece of wood whose thickness is about one-sixtieth of its length, and cutting along the middle with a thin saw from each end, leaving about eight feet in the centre solid. The beam may then be bent, and bolted or pinned together as before described. In either case the rib should be bent about one-fourth more than it is intended to remain, to allow for springing back. A parabolic curve is the form most recommended; but a circular arc, rising half the height of the roof, will answer the purpose. *Fig.* 18 represents the truss of a truncated roof strengthened by a curved rib, the suspending pieces being, when the rib is formed in the manner first described, placed at each joint, and each consisting of two pieces, one on each side of the rib, notched to it and the beam, and fastened by bolts and straps.

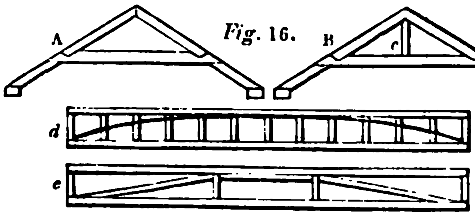


Fig. 16.

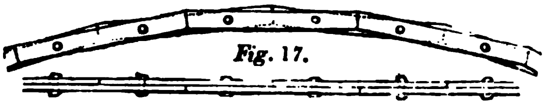


Fig. 17.

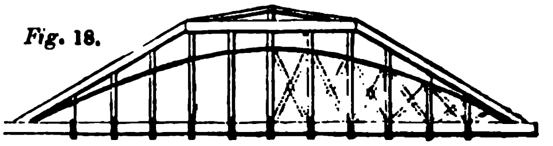


Fig. 18.

One of the advantages of this mode of construction is that the tie-beams may be suspended from any number of points, which is important in large spans, where the beams have to be formed of several pieces scarfed together. [SCARFING.] Diagonal braces, though unnecessary with parabolic curves, may be added to meet accidental strains, as shown by the dotted lines in the cut. This principle of construction, with an arc composed of several pieces of timber, was followed in one of the largest roofs ever built, that erected in 1791 over a riding-house at Moscow. The span of this roof, which has been said to be the most extensive in the world, is stated by Tredgold at 235 feet, the slope being about 19°, and the external dimensions of the building 1920 by 310 feet. He states that it had sunk so much that it was proposed to add a second curve for additional strength.

A simple and economical roof, invented by Mr. A. H. Holdsworth, and rewarded by the Society of Arts in 1820, is supported by curved ribs of timber applied in a different manner. A detailed description is given in the 38th volume of the Society's 'Transactions,' but *Fig.* 19 will sufficiently explain the principle of its construction: *a* is a beam serving as a tie-beam, and also to support the upper floor of the building; *b b* are curved ribs, formed in a similar manner to those just described, the lower ends of which are firmly secured to the tie-beam *a*. The principal rafters rest on these ribs, and their lower ends bear upon short timbers resting on the walls, these pieces being fastened by strong iron straps to the curved ribs, to counteract the outward thrust of the rafters. By this arrangement the whole of the interior of the roof, which is usually encumbered with king-posts, queen-posts, braces, &c., is rendered available for useful purposes, in addition to which it effects a considerable saving of timber.

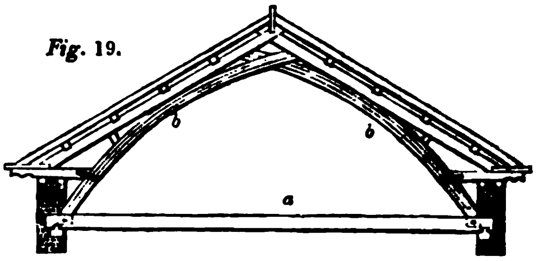


Fig. 19.

Wrought-iron straps of various forms are very useful, when judiciously applied, in strengthening the joints of a roof. They should be fixed with regard to the unavoidable tendency of the timbers to shrinking, so that while they may, in some cases, counteract or lessen its effect, they may so far yield to it as to prevent a strain which should come upon a timber, being entirely thrown, by its alteration of form, upon the strap. Tie-beams are often suspended to the trussing-posts by means of straps, so arranged as to allow the beam to be keyed up to its true position in case of the roof sinking. When this is not the case, the ties are sometimes drawn up into a slightly convex or cambered form, to meet the same contingency. Height may be gained inside a building by disposing the timbers as in *Fig.* 20, the want of a continuous tie-beam being compensated for by an iron strap to unite the ties to the bottom of the king-post at *a*; but it is evident that the safety of the plan must depend wholly on the straps, which alone counteract the outward thrust of the rafters.

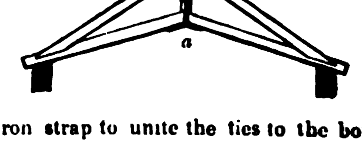


Fig. 20.

fing a church with a nave and side aisles, the con- f the tie-beams may be dispensed with, interme- port being obtained from columns. It is however ' to guard carefully against any lateral strain to nns.

of the high-pitched roofs of old Gothic churches s are very ingeniously contrived, but they often eat pressure on the walls, owing to the absence or position of the ties; thereby rendering very solid l buttresses necessary. The *Norman roof* is an s contrivance for the construction of roofs of large ı small pieces of wood. *Fig.* 21 shows this arrange- which all the rafters abut on joggled king-posts, ı there are several, their relative position being ed by diagonal braces. The timbers of this kind

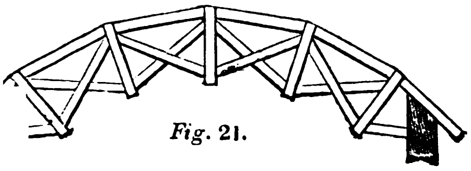


Fig. 21.

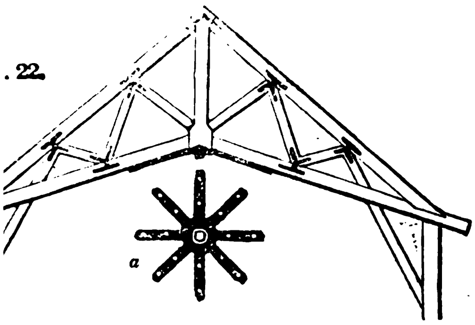
.re often left visible, being so carved as to have an ıal effect. Such a roof may be made to exert very ırious pressure on the walls.

the space covered in is of an irregular shape, it is range the inclined planes of the roof in a similar o those of a rectangular building, leaving a level in the centre, corresponding to the plan of the in- ace. Where the space covered is circular, ellipti- lygonal, although the construction of the roof may .ore complicated to the eye, it is, in fact, simpler r than that of a quadrangular building, the strain of being more equally distributed. The nearer a oaches to a circle in plan, the stronger it will be, deriving that mutual support from each other which distinguishing character of the dome. Domes of great size, have been made without trussing, ' forming the timbers into curved ribs abutting on ›lates, which then form a circle, and kept in their sitions by horizontal circles framed with them at

As the ribs approach the upper part of the dome, vals between them diminish in width, to allow for ery second or third rib is discontinued at intervals, of the ribs thus discontinued being received by the l circles, which may be compared to purlins, the g the place of rafters. The wooden dome formerly ıt the Halle aux Blés, at Paris, was a remarkably ıple of this kind, being 200 feet in diameter, and large opening in the centre. It was built at the n of M. Moulineau, and, having been destroyed by ›een replaced by a similar structure of iron, but of imensions.

the roof approaches the circular form, but not ly to have the character of a dome, it may be con- consisting of several trusses resembling those of ry roof, but so contrived as to intersect each other entre; the king-post being common to all the *Fig.* 22, representing a design for a polygonal n Nicholson, may illustrate this, and exemplify of the applications of iron straps: *a* shows the he strap by which the ties are secured to the king- e post having as many faces, and the strap as as, as there are trusses in the roof.

. 22.



ı the number of contrivances for the construction ; very great, as may be seen by reference to various works on carpentry, allusion can here be made to only one other. It is an admirably simple plan for making a very flat roof, described in the 37th volume of the 'Transactions' of the Society of Arts, in a communication from the inventor, Mr. Smart. The beams or rafters are cut, with a circular saw, as shown at *a*, *fig.* 23, while *b* represents their form when in use, a wedge being inserted between the ends of the parts that are elevated into a sloping position. These may be raised to an angle of 10° or 12°, and will bear a great weight, as they cannot be depressed without thrusting off the ends of the beam, or breaking the lower part of it by tension. This is called, by the inventor, the *bow and string rafter*, and was used by him to support a roof at the Ordnance Wharf, Westminster Bridge. Strong laths were nailed upon the rafters, and on these a platform of bricks was laid in cement, the whole being covered with tiles also bedded and pointed with cement, and twice coated with hot linseed-oil. The cost of this roof is stated to be not more than half that of lead. For a further notice of the experiments of the inventor of this simple truss, see **Trussing**.

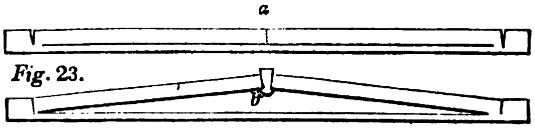


Fig. 23.

In the valuable practical works of Nicholson, Tredgold, &c. the methods of calculating the strength necessary in the various parts of a roof may be found; and in the 'Principles of Carpentry,' by the latter author, tables are given of the dimensions suitable for different spans. The table here quoted refers to a roof similar to *fig.* 7; the trusses being not more than ten feet apart, and the pitch at an angle of about 27° with the horizon, for a covering of slates. The scantlings are suited for yellow fir, and must be some what increased for timber of inferior quality.

Span.	Tie-beam.	King-post.	Principal Rafters.	Braces.	Purlins.	Common Rafters.
Feet.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
20	9½ × 4	4 × 3	4 × 4	3½ × 2	8 × 4¾	3½ × 2
22	9½ × 5	5 × 3	5 × 3	3¾ × 2¼	8¼ × 5	3¾ × 2
24	10½ × 5	5 × 3½	5 × 3½	4 × 2½	8½ × 5	4 × 2
26	11½ × 5	5 × 4	5 × 4¼	4¼ × 2½	8¾ × 5	4¼ × 2
28	11½ × 6	6 × 4	6 × 3½	4½ × 2¾	8¾ × 5¼	4½ × 2
30	12½ × 6	6 × 4½	6 × 4	4¾ × 3	9 × 5½	4¾ × 2

For the strength of different materials, under various circumstances, the reader may consult **Materials, Strength of**, vol. xv., p. 8. As a general remark, it may be observed that oak, when exposed to tension, is weaker than fir, and is therefore less adapted for ties. Being however less compressible, it is usually preferred for rafters, straining pieces, and struts; but Tredgold observes that its greater tendency to warping in summer renders it less fit for rafters and purlins than foreign fir. Cast-iron is not much used, except in fire-proof roofs, and each piece requires to be well tested. Wrought-iron is very useful for straps and fastenings, and also for ties and trussing-posts; but care is always necessary to guard against imperfections, which are more likely to pass unobserved than in wood. Wherever iron is applied, provision should be made for its expansion and contraction, and it is desirable to protect it from oxidation by painting. Though iron is far stronger for its size than any kind of timber, it is neither so strong nor so cheap as yellow fir, *weight for weight*.

The joints in the frame-work of a timber roof are of various kinds, according to the nature of the strain they have to resist. They should be formed with great care, and with due regard to such probable changes of form as all constructions of timbers are liable to from shrinking and warping. *Cocking* or *cogging* is the name given to that kind of joining in which one piece of timber, in a state of tension, is so attached to another that it cannot be drawn away without one piece breaking. *Figs.* 24 and 25 represent two methods of cocking the ends of tie-beams on the wall-plates, giving a plan and elevation of each. In both figures *a* represents the beam, and *b* the wall-plate. In the first plan, which was formerly much practised, the contraction of the dove-tailed end of the beam would allow it to be

Fig. 24.

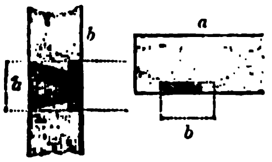
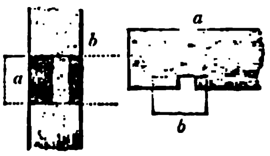


Fig. 25.



drawn considerably out of its place, and would therefore permit the walls to spread; but in the second the amount of contraction is diminished, owing to the small width of the rectangular tongue that enters the tie-beam, while its position is such as to prevent the beam being drawn out of its place beyond the actual extent of the contraction of the tongue. The shrinking of the joggles of king-posts and queen-posts is often productive of serious derangement, a circumstance greatly in favour of the substitution of iron for wood for such parts, especially in large roofs. This inconvenience is sometimes avoided by making the upper ends of the principal rafters abut immediately upon each other, as represented in *fig*. 12. A similar arrangement is made, in some cases, where wooden king-posts are used, the king-post and rafters being strapped together with iron. The sinking of a roof, particularly if it be of low pitch, is very injurious to the mortise-and-tenon joints of the struts and rafters, by throwing the strain on the shoulders of the tenons in such a way as to break off the tenons or splinter the wood. To guard against such injuries, it has been proposed by M. Perronet, a French engineer, instead of making the tenons and joggles square, to form them into circular arcs, the centres being at the opposite end of the strut or rafter. This plan appears worthy of general adoption, as it allows the joints to accommodate themselves to changes of form without injury. All the timbers of a roof are usually fitted and framed together on the ground, and taken to pieces again before being elevated to the building.

Allusion has been made in a previous column to the various materials used for the covering of roofs, with reference to the different degrees of inclination suitable for them. Thatched roofs have been considered by some to maintain the most equable temperature in the buildings covered by them, keeping out alike the extreme heat of summer and cold of winter. They are objectionable on account of their harbouring vermin, being easily damaged by wind, and dangerously combustible. The frequent repairs required make thatch also an expensive material. Besides straw, reeds and heath are sometimes used for thatching, and possess the advantage of greater durability. Tiles admit heat and moisture more than good slates. Pan-tiles, having no holes for nailing through, are simply hung, by ledges, upon laths nailed to the rafters. Plain tiles, laid in mortar, and over-lapping, so as to be double thickness everywhere, make a very good though heavy covering. Tiles of a peculiar form, called *hip-tiles*, are used for covering salient angles; and *gutter tiles*, which are similar to them, but placed with the concave side upwards, in the valleys or receding angles. Slates are laid in various ways. They are sometimes nailed down on a close boarding; or, if large, on *battens*, or pieces of wood from two and a half to three inches wide, and three quarters of an inch to an inch thick, which are nailed to the rafters at intervals regulated by the length of the slates. Lozenge-shaped slating is occasionally used, and has an ornamental appearance, but is easily injured, as there is but one nail through each slate. It is always laid on boarding. For what is called patent slating the best large slates are selected, and fixed without either boarding or battening, the common rafters being placed at such a width as to come under the joints. The slates are screwed down, the courses over-lapping about two inches. The meeting joints are covered by fillets of slate about three inches wide, set in putty, and screwed down; and the hips and ridges are sometimes covered in the same manner, though it is best in all such cases to use lead. Patent slating, when well executed, is water-tight with as low a slope as one in six. In some districts laminæ of stone are used in lieu of slates or tiles. Shingles, which are like slates, but made of wood, were formerly much used in covering pyramidal steeples, and in roofs of steep pitch. They are still used in the United States, and are usually laid on boarding, in a similar manner to common slates.

Sheets of metal are very convenient for covering domes, and curved or angular surfaces generally; and also for flat roofs, or such as have too little slope for slating. Lead is the most common material for such purposes, though copper, iron, tinned iron, and recently zinc, are also used. Lead terraces or flats are commonly laid on boarding or plaster. The joints are sometimes soldered, but the most approved method is to roll or wrap the edges into each other, making allowance for expansion and contraction. A fall of a quarter of an inch in a foot is sufficient for surfaces covered with sheet metal.

Cements of various kinds have been applied to the formation of roofs, and in some cases with success, though they have often been found to crack, and thereby become permeable to water. Mixtures of tar with lime, sand, gravel, ashes, &c., have been recommended; and asphalte has been applied to this purpose, apparently with great advantage. Compositions of tar, resin, and similar substances, spread upon sheets of coarse paper, have also been used.

(Nicholson's *Architectural Dictionary*, *Practical Builder*, &c., &c ; Tredgold's *Principles of Carpentry*; Robison's *Mechanical Philosophy*.)

ROOK (*Corvus frugilegus*, Linn.), This well-known gregarious and familiar bird (for it seems to affect the neighbourhood of man, and even not to be scared by the smoky atmosphere of great towns) is the *Cornacchia nera* and *Cornacchione* of the Italians; *Graye*, *Grolle*, *Freux*, and *onne* of the French; *Corneille Moissoneuse* of Br, *Schwartze Krähe* of the Germans; *Roka* of the Swedes; *Rook* of the modern British, and *Ydfran* of the antient British.

Belon and Caius, the latter of whom names the Rook *Spermologus*, *seu Frugilega*, appear to be of opinion that it is the σπερμολόγος of Aristotle (*Hist. Anim.*, viii. 3). It is doubtless, as Pennant observes, the *Corvus* of Virgil, who has happily described a flock of them

> 'E pastu decedens agmine magno.' (*Georg.*, lib. i., v. 381.)

Geographical Distribution.—The Rook is spread over the greater part of Europe; but nowhere does it seem to be more abundant than in Great Britain and Ireland. Wooded and cultivated districts are its favourite haunts. The north the observer goes in Scotland, the fewer rooks we see. In Orkney and Shetland there are none, nor are there any in Guernsey and Jersey. They do not appear to be numerous in Denmark, nor in the southern districts of Sweden, nor in Russia and northern Asia, though they may be seen there. In Italy the rook is common and permanent: but it appears to be migratory over a part of the continent of Europe. In France it is also common, and the following quatrain appears under the cut of it in the *Portraits d'Oyseaux*:

> 'Jamais le Freux ne hante le rivage,
> Et ne se paist que de grains et de vers,
> Il est oyseau commun, gros et pervers,
> Qui vole en trouppe, et crie à l'avantage.'

It occurs between the Black and Caspian seas; and Dr. Von Siebold and M. Bürger note it among the European birds seen by them in Japan.

Food, Habits, &c.—Grain, and insects especially, form the food of the Rook, and there can be no doubt that it amply repays the farmer for the seed which it takes, by its assiduity in clearing his land of wire-worms and the larvæ of the cock-chaffer (*Melolontha vulgaris*). These last are called Rook-worms in many places, and the birds may be seen following the plough-tail to gather them up as the share exposes them. In the end of May and beginning of June, when the young are able to fly and go abroad with their parents, they may often be seen among the bright green leaves of the horse-chestnut and other trees bending the branches with their weight as they assemble to pick off the cock-chaffers in the winged state. Where these birds have been inconsiderately destroyed, on account of the supposed damage which they had done, a total failure of the crops has made the farmer glad to try to get them back again. The stick-built nest contains four or five pale greenish eggs, blotched with dark greenish brown: these are sometimes palmed upon the undiscerning for Plover's eggs, but are easily distinguished from them. Not that a rook's egg is by any means bad; though far inferior in every respect to the other. The male is most attentive to the female while she is setting, and feeds her assiduously: both are very industrious in supplying their young, and the skin under the tongue may at this season be often seen dilated into a kind of pouch by the collected food. During the building se re great squabbles among themselves about their An account of one of their battles with the Herons possession of a disputed territory is alluded to in the IERONS [vol. xii. p. 167]. They frequently visit their s in the autumn on their way to roost in some dis-d, and come to them for the purpose of repairing st, and setting about the business of incubation early h.

Rook is not without the power of mimicry granted ly to the greater part of the true crows, is docile, of learning amusing tricks, and becomes much to the kind hand that feeds it. It has been heard e the note of a jackdaw (Hewitson) and the bark-ogs so perfectly that if the mimic had been out of ear could have discovered the deception. (Macgil-

ties.—White, pied, and cream-coloured. 'A gen-says the charming author of the *History of Selborne*, milk-white rooks in one nest. A booby of a carter, hem before they were able to fly, threw them down royed them, to the regret of the owner, who would n glad to have preserved such a curiosity in the I saw the birds myself nailed against the end of a l was surprised to find that their bills, legs, feet, and re milk-white.' These perhaps were perfect albinos, it so have continued; but instances are not wanting e original light colour deepens into the usual sable Mr. Yarrell quotes Mr. Hunt of Norwich, who at a gentleman of his acquaintance had in 1816 rook of a light ash-colour, most beautifully mottled with black, and the quill and tail feathers elegantly but when the bird moulted it became a jet-black in this state was suffered to join its sable brethren lds. Mr. Yarrell remarks that this agrees with his rvations, and he adds that accidental varieties will be found to be comparatively small and weak these young birds increase in age and gain con-il power, the secretions, he observes, become per-the plumage assumes its natural colours, whilst the on of white feathers, by old birds, is probably the the converse operation of the physiological law. *Birds.*)

Head and Foot of Rook.

been, and indeed still is with some, a question the loss of the feathers at the base of the beak in ng rook upon the first moult, is or is not a specific on, or merely the result of denudation from plung-bill into the ground in search of prey. It must be mind that some foreign birds resemble the rook in ticular. Mr. John Blackwall's observations (*Re-in Zoology*) touching this matter are full of inte-le refers to a rook preserved in the Manchester n, which has its mandibles crossed near their extre-but so slightly that the malformation could not have ed materially with the mode of procuring food usually l to by rooks, as is clearly shown by the denuded state of the nostrils and anterior part of the head, both of which are entirely destitute of feathers. But he notices another specimen, in the possession of Mr. R. Wood of Manchester, which has the mandibles greatly elongated and much curved. 'Now,' says Mr. Blackwall, 'it is evident that the bird possessing a bill thus formed could not thrust it into the ground in search of worms and larvæ of insects, as the rook is known to do habitually; and accordingly the plumage at the base of the bill of this individual, and the bristly feathers which cover its nostrils, are very conspicuous, not having sustained the slightest injury. The opinion entertained by many persons that the naked condition of the nostrils and anterior part of the head is an original peculiarity in the rook, is thus satisfactorily proved to be incorrect; indeed, the fact that young rooks exhibit no deficiency in these particulars, is sufficiently conclusive on this point; but the possibility of an entire species being endowed with an instinct destructive of a usual portion of its organization was probably never contemplated by these observers; it is not surprising therefore that the inference deduced from a partial view of the subject should be erroneous.'

ROOKE, SIR GEORGE, ADMIRAL, the eldest son of Sir William Rooke, was born at his father's seat, the priory of St. Lawrence near Canterbury, in the year 1650. He entered the navy as a volunteer, and at the age of thirty had attained the rank of post-captain. In 1689 he was sent out as commodore with a squadron to the coast of Ireland, where his services were such as to induce William III. to promote him to the rank of rear-admiral of the red. He soon afterwards bore a part in the indecisive action between the earl of Torrington's fleet and that of the French admiral Tourville, off Beachy Head.

In 1692 Rooke was advanced to the rank of vice-admiral of the blue, and greatly distinguished himself in the battle off Cape La Hogue (properly La Hague) between the French fleet and the combined English and Dutch fleets under admiral Russell, May 19, 1692; but a part of the French fleet having escaped into La Hogue, and being hauled up so high that the English ships of the line could not reach them, Rooke volunteered on the following day to attack them with the boats of his squadron. This service he performed at night under cover of a fire from his frigates and smaller vessels; and so well was his plan contrived, and so unexpectedly and suddenly executed, that though six French three-deckers were burnt that night and seven other ships of the line on the following morning, the loss of the English only amounted to ten men. For this exploit Rooke was rewarded with the rank of vice-admiral of the red, a pension of 1000*l.* a year, and the honour of knighthood.

After the peace of Ryswick in 1697, Sir George Rooke was elected member of parliament for Portsmouth; and though he was attached to the Tory party, then in opposition to the government, queen Anne, on her accession in 1702, appointed him 'vice-admiral and lieutenant of the admiralty, and also lieutenant of the fleets and seas of this kingdom,' having previously constituted her royal consort prince George of Denmark generalissimo of her forces by land and sea.

The war of the succession had now commenced, and an attack upon Cadiz was resolved upon, the land-forces being under the command of the duke of Ormond, and the combined English and Dutch fleets under Rooke. The attack was begun, but, in consequence of the opposition of the prince of Hesse, was not persevered in. Having received intelligence however that the Plate fleet, under convoy of a French squadron, had taken shelter in the port of Vigo, the duke and Sir George resolved to proceed there. The duke stormed the town with 3000 men, while the fleet took and destroyed seventeen ships; six galleons being taken by the English and five by the Dutch, who burnt five others. The value of the specie and goods taken was estimated at five millions of dollars.

Sir George Rooke having been joined by Sir Cloudesley Shovel, with a large reinforcement from England, they resolved to make an attack upon Gibraltar. On the 21st of July, 1704, the prince of Hesse, with 1800 marines, was landed on the isthmus, while the ships commenced a cannonade upon the fortress, which, having been kept up for about six hours, the Spaniards began to fly from the batteries. The boats were then manned and armed, and the seamen succeeded in making themselves masters of the great platform, which they retained till the following day, when a reinforcement of seamen enabled them to carry another strong battery, which put them in possession of most of the enemy's cannon. The governor then accepted the offered terms of capitulation, and the fortress surrendered.

On the 9th of August, 1704, Rooke fell in with the French fleet under the Comte de Toulouse, who had recently put to sea from Toulon, with fifty-two ships of the line and twenty-four galleys. The French admiral endeavoured to get away, though, according to Rooke's statement, he had a superiority of 600 guns, but on the 13th of August Rooke brought him to action off Malaga. The battle began in the forenoon, and ended with the day, when the French went off to leeward, and, the weather being hazy, escaped. This was a hard-fought battle. The French lost upwards of 3000 men, and the English upwards of 2000.

Sir George Rooke on his return to England was received by queen Anne at Windsor with great distinction, but finding that the government was hostile to him, he resigned his employments, gave up his seat in parliament, and passed the rest of his life at his seat of St. Lawrence, where he died on the 24th of January, 1709, aged fifty-eight, and was buried in the cathedral of Canterbury. He was thrice married. (Campbell's *Lives of the Admirals*; Locker's *Gallery of Greenwich Hospital*.)

ROOKER, MICHAEL ANGELO, an artist of considerable merit as a landscape-painter and engraver, was born in London about the year 1743. His father, Edward Rooker, also a skilful designer and engraver, who excelled in landscapes and architectural views, appears to have been a singular character, having for some time acted as a harlequin at Drury-Lane Theatre. Michael Angelo was taught engraving by his father, and executed the head-pieces to the 'Oxford Almanack' for several years, from his own drawings. In landscape-drawing, which is said to have been his favourite occupation, he was instructed by Paul Sandby, whose style he imitated. His manner is not powerful, but his drawings display much taste and feeling. For several years Rooker painted the scenes for the Haymarket Theatre. He was one of the earliest associates of the Royal Academy, and died on the last day of February, 1801, at the age of fifty-seven or fifty-eight.

ROOS, PHILIP PETER, a painter commonly called *Rosa da Tivoli*, from his long residence at that place, was born at Frankfort in 1655. He was instructed in art by his father, who was in the service of the landgrave of Hesse, by which prince Philip was sent to Italy, and allowed a pension during the period of his study. On arriving at Rome, he applied himself assiduously to painting, and acquired a most astonishing facility of hand; indeed, such was his rapidity of execution, that C. le Blond, who was at the same time at Rome, declares that Roos copied in chalk the arch of Titus within half an hour, and that with a considerable degree of finish. He devoted his talents chiefly to painting animals, which he designed mostly from nature. To facilitate his studies he established himself at Tivoli, where he kept a kind of menagerie for the purpose of drawing from the life with correctness such animals as he required for his pictures. His other subjects generally represent pastoral scenes, with herdsmen and cattle, and works of a similar nature, some of which are executed as large as life. His groups are composed with great judgment; and the landscapes in his backgrounds, his skies and distances, are treated with surpassing truth, and executed in a masterly style. Yet, although he painted with great facility, his productions betray no appearance of negligence or inattention; they are free, without being deficient in finish. His pictures, according to Lanzi, are to be found in the galleries of Vienna, Dresden, and other capital cities of Germany, besides an immense number in Italy and many in England, though we have no specimen by his hand in the National Gallery. He was a member of most of the principal academies of Europe. He is said by Huber to have etched a few plates of pastoral subjects, which are very scarce. M. Périès, in the 'Biographie Universelle,' mentions three pictures by this master which were in the Musée Napoléon, but which were returned to Vienna, whence they had been taken, in 1815. These are a view of the Cascade of Tivoli, a picture of animals, and a wolf devouring a sheep, the landscape in which latter work was painted by Tempesta. (Pilkington's *Dictionary*, by Fuseli; Lanzi, *Storia Pittorica*, ii. 174; *Biographie Universelle*.)

ROOT. The mathematical use of this term has gradually been extended, until it may be defined as follows: every value of an unknown quantity which satisfies a given equation is called a root of that equation. Thus, 2, 1, $1+\sqrt{(-3)}$ and $1-\sqrt{(-3)}$ are the roots, and all the roots of the equation

$$x^4=5x^3-12x^2+16x-8,$$

since they are the only algebraical formulæ and arithmetical numbers which satisfy it. On this general use of the term root, see THEORY OF EQUATIONS and INVOLUTION.

The more common use of the term root is as follows: the seventh root of 8 is the incommensurable fraction whose seventh power is 8, or the solution of the equation $x^7=8$. There are altogether seven such solutions, one only arithmetical, the others of the form $a+b\sqrt{(-1)}$; the method of obtaining the arithmetical solution has already been discussed in the article INVOLUTION; the importance of the SQUARE ROOT will justify its consideration in an article apart. We reserve for the present article the method of finding and using any root (in the common sense) of any algebraical quantity, a necessary completion of the article NEGATIVE AND IMPOSSIBLE QUANTITIES.

Every algebraical result is of the form $a+b\sqrt{(-1)}$ at widest, or may be reduced to that form. Here a and b are meant to be real algebraical quantities, that is, reducible to positive or negative whole numbers or fractions, commensurable or incommensurable. Thus, if $b=0$, we have the simple real quantity a; if $a=0$, we have the simple impossible quantity $b\sqrt{(-1)}$. It is indifferent, as to the present article, in what light the impossible quantity $\sqrt{(-1)}$ is considered; whether, as in NEGATIVE AND IMPOSSIBLE QUANTITIES, upon that extended system of definitions which makes it explicable and rational, or upon the more common system in which it is used without such explanation: for we are now merely considering all algebraic formulæ as results, subject to certain laws by which their use is to be regulated, and without any reference to interpretation. When we desire to consider only the arithmetical root of an arithmetical quantity, we shall use the symbols $\sqrt{}$, $\sqrt[3]{}$, $\sqrt[4]{}$, &c., but the exponential fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, &c. will denote any one of the algebraical roots of a formula. Thus $\sqrt{16}$ means simply 4; but $(16)^{\frac{1}{2}}$ is an ambiguous symbol standing for either $+4$ or -4. And when we have an equation which presents an ambiguous formula equated to an unambiguous one, we mean that the unambiguous side of the equation is *one* of the values of the ambiguous one: in this sense $(1)^{\frac{1}{3}}=\frac{1}{2}\left(-1+\sqrt{(-3)}\right)$. When we use the simple arithmetical symbol $\sqrt{}$ before an algebraical quantity, as in $\sqrt{(-3)}$, we merely mean to signify that the two values of $(-3)^{\frac{1}{2}}$ are distinguished into $+\sqrt{(-3)}$ and $-\sqrt{(-3)}$.

Let us now take a quantity of the form $a+b\sqrt{(-1)}$. Assume r cos. $\theta=a$, r sin. $\theta=b$, which gives

$$r=\pm\sqrt{(b^2+a^2)} \qquad \tan.\ \theta=\frac{b}{a}.$$

Let us choose for r, which is called the *modulus* of the expression, the positive value $\sqrt{(b^2+a^2)}$. We can then always make the angle θ give the equation

$$a+b\sqrt{(-1)}=r\cos.\ \theta+r\sin\theta\ \sqrt{(-1)}\ \ldots\ldots (1)$$

identically true. If a and b be both positive, θ must lie between 0 and a right angle, or between 0 and $\frac{1}{2}\pi$ [ANGLE]: if a be positive and b negative, θ must lie between $\frac{3}{2}\pi$ and 2π: if b be positive and a negative, θ must lie between $\frac{1}{2}\pi$ and π: and if both be negative, θ must lie between π and $\frac{3}{2}\pi$. Thus reducing angles to degrees and minutes,

$$\begin{aligned}
2+3\sqrt{(-1)}&=\sqrt{13}\ \{\cos.\ 56^\circ\ 19'+\sin.\ 56^\circ\ 19'.\ \sqrt{(-1)}\}\\
-2+3\sqrt{(-1)}&=\sqrt{13}\ \{\cos.\ 123^\circ\ 41'+\sin.\ 123^\circ\ 41'\ \sqrt{(-1)}\}\\
2-3\sqrt{(-1)}&=\sqrt{13}\ \{\cos.\ 303^\circ\ 41'+\sin.\ 303^\circ\ 41'\ \sqrt{(-1)}\}\\
-2-3\sqrt{(-1)}&=\sqrt{13}\ \{\cos.\ 236^\circ\ 19'+\sin.\ 236^\circ\ 19'\ \sqrt{(-1)}\}
\end{aligned}$$

Generally, if a and b be positive, and if, returning to the theoretical mode of measuring angles, θ be that angle which lies between 0 and $\frac{1}{2}\pi$ and has $b:a$ for its tangent, we must use θ for $a+b\sqrt{(-1)}$, $\pi-\theta$ for $-a+b\sqrt{(-1)}$, $2\pi-\theta$ for $a-b\sqrt{(-1)}$, and $\pi+\theta$ for $-a-b\sqrt{(-1)}$.

Again, since $\theta+2k\pi$ has the same sine and cosine as θ, when k is any whole number, positive or negative, if we take θ so as to satisfy (1), we find that the following is satisfied:

$$a+b\sqrt{(-1)}=r\ \{\cos.\ (\theta+2k\pi)+\sin.\ (\theta+2k\pi).\ \sqrt{(-1)}\}\ \ldots (2)$$

for all integer values of k positive or negative, but not any fractional value of k whatsoever. This and various results of common trigonometry should be familiar to every student who attempts the present subject.

non multiplication makes it obvious that
$x+\sin. x\,.\,\sqrt{(-1)}\}\ \{\cos. y+\sin. y\,\sqrt{(-1)}\}=$

$$\cos. (x+y)+\sin. (x+y)\,\sqrt{(-1)}$$

real values of x and y; so that if we represent
-sin. $x\,.\,\sqrt{(-1)}$ by ηx we have $\eta x\times\eta y=\eta(x+y)$.
Binomial Theorem it is proved that this equation
e universally true without giving as a consequence
(nx), for all values of n, whole or fractional, positive
ive. We have then

$$\text{-sin. } x\,\sqrt{(-1)}\}^n=\cos. nx+\sin. nx\,.\,\sqrt{(-1)}\ \ldots (3)$$

ion which goes by the name of De Moivre's Theorem.
key of the present subject.

now be required to raise the nth power of $a+$
, n being integer or fractional, positive or negative:
udes every case of raising a power, extracting a root,
ng both operations, and taking the reciprocal of any
Reduce $a+b\sqrt{(-1)}$ to its equivalent form $r\eta(\theta+$

$$\{\cos. (\theta+2k\pi)+\sin. (\theta+2k\pi)\,.\,\sqrt{(-1)}\},$$

$a+b\sqrt{(-1)}\}^n$ is $\{r\eta(\theta+2k\pi)\}^n$ or $r^n\eta(n\theta+2nk\pi)$,
$\sqrt{(-1)}\}^n$

$$(n\theta+2nk\pi)+\sin.(a\theta+2nk\pi)\,.\,\sqrt{(-1)}\},$$

r^n is found by purely arithmetical operation, and
$2nk\pi)$ and sin. $(n\theta+2nk\pi)$ by aid of the trigono-
tables. So many distinct values as the variation
les us to give to $n\theta+2nk\pi$, so many values do we
$+b\sqrt{(-1)}\}^n$. Two angles are distinct when they
ual, and do not differ by 2π or a multiple of 2π.

, let n be a whole number, positive or negative,
is always an integer even number, and there is
value, namely,

$$+b\sqrt{(-1)}\}^n=r^n\{\cos. n\theta+\sin. n\theta\,.\,\sqrt{(-1)}\}.$$

n be a fraction in its lowest terms, and, choosing
le, say $n=\frac{4}{5}$. Let us examine all the values of k,
-5 to $k=+5$, making $A_k=n\theta+2nk\pi$.

$$-8\pi,\ A_{-4}=\frac{4}{5}\theta-\frac{32}{5}\pi,\ A_{-3}=\frac{4}{5}\theta-\frac{24}{5}\pi,\ A_{-2}=$$

$$\pi,\ A_{-1}=\frac{4}{5}\theta-\frac{8}{5}\pi,\ A_0=\frac{4}{5}\theta,\ A_1=\frac{4}{5}\theta+\frac{8}{5}\pi,\ A_2=$$

$$A_3=\frac{4}{5}\theta+\frac{24}{5}\pi,\ A_4=\frac{4}{5}\theta+\frac{32}{5}\pi,\ A_5=\frac{4}{5}\theta+8\pi.$$

t would seem as if from this set of the possible
k, we get eleven distinct values of the fifth root of
h power of $a+b\sqrt{(-1)}$. But a moment's inspec-
s that A_{-5}, A_0, A_5, are not distinct angles, since
r by multiples of 2π: neither are A_{-4} and A_1,
and A_2, nor A_{-2} and A_3, nor A_{-1} and A_4. Also
found that for every value of k

$$A_{k\pm5},\ A_{k\pm10},\ A_{k\pm15},\ \&c.,$$

ngles which differ, each from its predecessor, by 2π;
ere are but five distinct angles in the whole series,
ay be found by taking A_k, A_{k+1}, A_{k+2}, A_{k+3},
with any value of k positive or negative. And
, if n be a fraction whose denominator (when the
is reduced to its lowest terms) is q, it will be found
re are q distinct values of $\{a+b\sqrt{(-1)}\}^n$ and no

st important cases are those in which $r=1$, or a^2+
which $\cos. \theta+\sin. \theta\sqrt{(-1)}$ may represent the
And of this particular case, the most important
icular cases are

$\theta=0$ $\quad\cos. \theta+\sin. \theta\sqrt{(-1)}=1$
$\theta=\pi$ $\quad\cos. \theta+\sin. \theta\sqrt{(-1)}=-1$
$\theta=\frac{1}{2}\pi$ $\quad\cos. \theta+\sin. \theta\sqrt{(-1)}=\sqrt{(-1)}$
$\theta=\frac{3}{2}\pi$ $\quad\cos. \theta+\sin. \theta\sqrt{(-1)}=-\sqrt{(-1)}$

in, the two first are the most important.
$\ldots q$, and let the question be to find the q qth
1. Putting unity in the form cos. $2k\pi+$sin.
(-1), all these roots are the distinct values of

$$+\sin.\frac{2k\pi}{q}\sqrt{(-1)}\ \text{or}\ \left\{\cos.\frac{2\pi}{q}+\sin.\frac{2\pi}{q}\sqrt{(-1)}\right\}^k.$$

$$\frac{2\pi}{q}+\sin.\frac{2\pi}{q}\,.\,\sqrt{(-1)}=a,\ \cos.\frac{2\pi}{q}-\sin.\frac{2\pi}{q}\,.$$

$=\beta$.

Then $a\beta=1$, as will be found by multiplication, and $a^k=\beta^{-k}$: $a^k=a^{k\pm q}=\beta^{-k\pm q}$, since $a^q=1$. Consequently, since the series of powers of a, positive and negative, are successions of qth roots of 1, the series of powers of β will be the same; and we may therefore select these roots at convenience from either series, or partly from one and partly from the other. Thus, if we would have the ten tenth roots of unity we may form them in pairs, as follows:—

a^0 and β^0 give $\cos.\frac{2.0\pi}{10}\pm\sin.\frac{2.0\pi}{10}\sqrt{(-1)}$ both $=1$
a^1 and β^1 or a^9 . . $\cos.\frac{2\pi}{10}\pm\sin.\frac{2\pi}{10}\sqrt{(-1)}$
a^2 and β^2 or a^8 . . $\cos.\frac{4\pi}{10}\pm\sin.\frac{4\pi}{10}\sqrt{(-1)}$
a^3 and β^3 or a^7 . . $\cos.\frac{6\pi}{10}\pm\sin.\frac{6\pi}{10}.\sqrt{(-1)}$
a^4 and β^4 or a^6 . . $\cos.\frac{8\pi}{10}\pm\sin.\frac{8\pi}{10}.\sqrt{(-1)}$
a^5 and β^5 or a^5 . . $\cos.\frac{10\pi}{10}\pm\sin.\frac{10\pi}{10}\sqrt{(-1)}$ both $=-1$

Of these twelve forms, ten only are distinct, giving the ten tenth roots required. In this way the following theorems may be easily demonstrated.

1. The $(2m)$th roots of unity are $+1$, 1, and the $2m-2$ quantities contained in

$$\cos.\frac{2k\pi}{2m}\pm\sin.\frac{2k\pi}{2m}\sqrt{(-1)}$$

for all values of k from $k=1$ to $k=m-1$, both inclusive.

2. The $(2m+1)$th roots of unity are 1 and $2m$ quantities contained in

$$\cos.\frac{2k\pi}{2m+1}\pm\sin.\frac{2k\pi}{2m+1}\sqrt{(-1)}$$

for all values of k, from $k=1$ to $k=m$, both inclusive.

3. If μ be one of the qth roots of unity, μ^2, μ^3, ... are also qth roots, but do not contain all the q roots, unless μ be made from a value of k which is prime to q. Thus, if $q=12$, and $k=1$, we get

$$a=\cos.\frac{2\pi}{12}+\sin.\frac{2\pi}{12}\sqrt{(-1)}$$

the list of roots is complete in 1, a, a^2, a^3, ... a^{11}, and a^{12} is 1, a^{13} is a, &c.

But if we make $k=8$, or take a^8 for μ, we have

$$\mu^2=a^{16}=a^4,\ \mu^3=a^{24}=1,\ \mu^4=a^{32}=a^8,\ \mu^5=a^{40}=a^4,\ \&c.,$$

so that we get no roots from this series but a^8, a^4, 1, which are only the three cube roots of 1 (cube roots are among twelfth roots). But choose a^5 (5 is prime to 12) and its successive powers are a^5, a^{10}, a^{15} or a^3, a^{20} or a^8, a^{25} or a, a^{30} or a^6; a^{35} or a^{11}, a^{40} or a^4, a^{45} or a^9, a^{50} or a^2, a^{55} or a^7, a^{60} or 1, after which the series recurs in the same order.

4. If m be any factor of q, all the mth roots of unity are among the qth roots. Thus, if $q:m=v$, and if a be the first of the series of qth roots, the mth roots are a^v, a^{2v}, ... a^{mv} or 1. For $(a^v)^m=a^{vm}=a^q=1$, &c. All those powers of a which have exponents prime to q, may be called primitive qth roots of unity: thus the primitive 12th roots are a, a^5, a^7, a^{11}.

5. The qth roots of unity exist in pairs of the form $\cos. \phi\pm\sin. \phi\sqrt{(-1)}$. These pairs are are a and a^{q-1}, a^2 and a^{q-2}, &c., or a and a^{-1}, a^2 and a^{-2}, &c.

Let the question now be to find the qth roots of -1. If we now take

$$-1=\cos. (\pi+2k\pi)+\sin. (\pi+2k\pi)\,.\,\sqrt{(-1)}$$

we have all the qth roots in the distinct values of the formula

$$(-1)^{\frac{1}{q}}=\cos.\frac{(2k+1)\pi}{q}+\sin.\frac{(2k+1)\pi}{q}\,.\,\sqrt{(-1)}.$$

Let $a=\cos.\frac{\pi}{q}+\sin.\frac{\pi}{q}\sqrt{(-1)}$, then the qth roots required are a, a^3, a^5, ... a^{2q-1}, beginning with $k=0$, and ending with $k=q-1$. Thus, if μ be any one root, all the odd powers of μ (positive or negative) are also roots, but do not contain among them all the roots unless the value of $2k+1$, from which μ is derived, be prime to q. Thus if $q=15$ and if $\mu=a^9$, we have (since $a^{30}=1$)

$\mu^3=a^{27}=a$, $\mu^5=a^{45}=-1$, $\mu^7=a^{63}=a^3$, $\mu^9=a^{81}=a^{21}$, $\mu^{11}=a^{99}=a^9$;

so that we only get, from the powers of a^9, the distinct roots a^9, a , -1, a^3, a^{21}, which are also the fifth roots of -1. But if $2k+1$ be prime to q, all the qth roots of -1 may be obtained from μ. And as before, if m be any factor of q, all the mth roots of -1 are among the qth roots. Also these qth roots occur in pairs of the form $\cos.\,\phi \pm \sin.\,\phi\sqrt{(-1)}$, the pairs being a and a^{2q-1}, a^3 and a^{2q-3}, &c., or a and a^{-1}, a^3 and a^{-3}, &c.

Every qth root of -1 is one of the $(2q)$th roots of $+1$, and the $(2q)$th roots of $+1$ consist of all the qth roots of -1 and all the qth roots of $+1$.

The following equations will also be easily proved:—

$$\{\sqrt{(-1)}\}^{\frac{1}{q}} = \cos.\,\frac{(2k+\frac{1}{2})\pi}{q} + \sin.\,\frac{(2k+\frac{1}{2})\pi}{q}\sqrt{(-1)};$$

$$\{-\sqrt{(-1)}\}^{\frac{1}{q}} = \cos.\,\frac{(2k+\frac{3}{2})\pi}{q} + \sin.\,\frac{(2k+\frac{3}{2})\pi}{q}\sqrt{(-1)}.$$

As it is not our object here to write on the applications of these formulæ, but only to supply an article of reference for those who may have forgotten or imperfectly learnt the groundwork of this very important branch of analysis, we finish here, referring to SERIES for such applications as fall within the plan of this work.

ROOT is that part of a plant which is sent downwards into the earth, at the same time that the stem is sent upwards into the air. Every part of the plant which exists underground is not root, as large portions of the stem itself may remain under the surface of the earth; and large buds, called bulbs, also exist underground. These parts have been often confounded with the root. The creeping root, and some forms of the tuberous and bulbous roots of older botanical writers, are only so many different forms of the stem. [STEM.]

The root is distinguished by certain structural peculiarities, by which it may be easily known from the stem. First, its ramifications are irregular, not having the symmetrical form of branches, nor are they developed like branches from buds. Secondly, roots generally produce no leaf-buds. When they do appear, which occasionally occurs, they are called adventitious buds. Thirdly, roots never have leaves, scales, or other appendages developed upon their surface; and fourthly, the cuticle of roots is never found to possess stomates, which are frequently very numerous on various parts of the stem.

The smaller divisions of roots are called *fibrils*, which consist of a little bundle of ducts or spiral vessels, surrounded by woody fibres, lying in a mass of cellular tissue. At the apex of the fibril the cellular tissue is loose and devoid of cuticle, from which cause it absorbs more rapidly the fluid by which it is surrounded than the other parts of the root. Although the terminations of the roots cannot be considered as special organs, they have been named by De Candolle *spongelets* or *spongioles*, in reference to their absorbing power.

The relation between the size and extent of the roots and that of the branches varies very much. In some tribes, as the Coniferæ and Palmaceæ, the roots are very insignificant compared with the size of the stem. In other plants the roots are much the longest, as in the lucern, &c. In the greater proportion of trees the roots extend wider than the branches, but do not penetrate so deep as the stem is high.

The internal structure of the root resembles that of the stem, but in Exogens the roots do not possess a central pith. The cellular tissue of many roots is exceedingly abundant, and on this account they are used as articles of diet. Their nutritive property depends on the saccharine and other secretions which are deposited in the cells of the cellular tissue. Many of these roots, by attention to their culture, may be increased in size; and the growth of esculent roots is an object of importance in the kitchen garden. The principal esculent roots are: the Jerusalem artichoke (*Helianthus tuberosus*); turnip (*Brassica Rapa*); carrot (*Daucus Carota*); parsnip (*Pastinaca sativa*); red-beet (*Beta vulgaris*); skirret (*Sium Sisarum*); scorzonera, or viper's-grass (*Scorzonera hispanica*); salsafy, or purple goat's-beard (*Tragopogon porrifolius*); radish (*Raphanus sativus*). Besides these, which are commonly cultivated, there are many of our native plants which possess roots yielding a nutritive matter, and are occasionally used as articles of diet. The arrow-head, common arum, bitter vetch or mouse-peas, earth-nut, meadow-sweet, pilewort, sago, silver-weed, Solomon's seal, and common comfrey, are recorded as yielding edible roots. (*Cyclopædia of Gardening*, p. 882.)

During dry seasons and in dry situations the roots of many plants swell and become tuberous, which seems to be a provision for supplying nutriment to the stem and its appendages.

Roots are called *annual*, *biennial*, or *perennial*, according to their duration. When a root perishes after its first year's herbage and flowering, it is annual: if after the second year's herbage and first year of flowering, it is biennial. If a root endures for many years, although its herbage may perish every year, it is perennial.

There are various forms of roots distinguished by botanists. The *fibrous root* possesses a multitude of small divisions of the fibrillæ, as is seen in the Poa annua and many other grasses. The *nodulose root* presents occasional dilatations, as in the Phleum nodosum. A *præmorse root* is one in which the extremity of the primary axis has perished, or its development has been prevented by the extension of fibrillæ from its sides, as in the Devil's-bit Scabious (*Scabiosa succisa*). The *fusiform root* is seen in the carrot and turnip; such plants are also called tap-rooted. The term *tubercules* is applied by some to the roots of the orchis and dahlia; the former are *palmated* or *lobed*, the latter are *fasciculated*.

Although most if not all the higher plants possess roots, amongst many of the lowest forms they are not to be distinguished. The lower plants which float about in [illegible] as the Oscillatoria, Diatoma, &c., and which consist of [illegible] more than simple cells, possess no appendages which can be called roots. In many of the Confervæ a downward development of the cells of cellular tissue, attaching them to the objects on which they grow, has been observed. Some of the Lichens, as the *L. esculentus* of Pallas, and the lo forms of Fungi, as the Tremellas, &c., possess no ro Many of the floating water-plants, as the Aldrovanda ve[illegible]culosa, do not develop roots, and derive their nouris from the medium in which they live by the direct con [illegible] the cellular tissue. In fact we find that the simple [illegible] of cellular tissue in the lower plants perform all those[illegible]tions which, as we ascend in the scale of organization, are performed by particular parts of the plant. In the Charæ and the Marchantia, the roots become more evidently [illegible]veloped, and the downward growth of the cells [illegible] observable than in the Confervæ. On the lower surface [illegible] the Marchantia, prolongations of the cellular tissue [illegible] observed, which Meyen calls root-hairs or capillary [illegible] In the Equisetaceæ and Ferns the roots become more [illegible]fectly developed, and their surface is almost entirely co[illegible] with capillary fibrils. These fibrils are developed on [illegible] all roots, and perform the function of absorption. [illegible] are only seen on recently-formed roots, as with the i[illegible] age of the root they drop off; and in old roots none [illegible] are found. They are not so numerous in the roots of higher plants as in those of the lower, but their nu[illegible] varies exceedingly according to the circumstances in wh[illegible] a plant is placed. The number of these root-hairs is greatest in those plants which derive their nutriment from the earth, and accordingly they may be looked upon [illegible] a provision for extending the absorbing surface. [illegible] attain sometimes the length of a quarter and the [illegible] an inch.

In many plants the roots, instead of being covered with the capillary fibrils, present a condensed membrane, [illegible] also encloses the roots as in a sheath, and extends to [illegible] point of the root where the fibrils commence their gr[illegible] This structure occurs in most water-plants, and in the r[illegible] of those plants which are accidentally projected into [illegible] and in some land-plants. It drops off with incr[illegible] in the same manner as the root-hairs. Meyen con[illegible] this sheath a modification of the root-hairs, and hence i[illegible] that it performs the same functions. (Meyen, *Neues S[illegible] der Pflanzen Physiologie*, band ii.)

What the absorbent vessels are to the animal, the[illegible] are to the plant, and a difference between plants and ani[illegible]mals has been pointed out as dependent on the relative [illegible]ation of their organs of absorption. The animal derive[illegible] nutriment, by means of its absorbents, from an inte[illegible] reservoir, the stomach; whilst the plant derives its nutr[illegible] from an external reservoir, the earth. The spongioles [illegible] ots, as we have already stated, are the active agents in e absorption of nutritious matter from the soil. By some tanists it is supposed that no other part of the root ab-bs except the spongiole; but from the observations of yen and others it appears that the capillary fibrils and e epidermis of the root have also the power of absorbing uid, though not in so high a degree as the delicate point newly developed tissue situated at the extremity of the illa. The power of absorbing by the spongioles is supsed by De Candolle to be due to the capillarity and hyoscopicity of the cellular tissue of which they are comsed. Dutrochet explains the absorption of fluids by ants on his theory of endosmose. But whatever theory brought forward to explain the process, it cannot be cont be considered as merely mechanical, as the process ases immediately on the death of the plant, and is unubtedly connected with those more complicated relations matter whose result we term vitality.

Roots do not absorb everything that is presented to them. was long ago ascertained by Davy that plants did not sorb particles of charcoal and other substances that be fused through water. Experiments also by Meyen, Link, l others, prove that the colouring matter of various infuns is not taken up by the roots, and that when this has en supposed to have taken place, it has arisen from mistak- a deposition of the colouring matter on the outside of the ue for an absorption into it.

When the roots of plants are placed in solutions of gum, ar, starch, &c., they thrive if the solutions are thin; but hick solutions of these substances be prepared, the plants in them. Experiments of this kind were performed by H. Davy, who attributed the non-absorption of the thick ution, and the death of the plant, to the blocking-up of pores of the vegetable tissue by the thick matter. But theory of endosmose and exosmose gives a far better planation of these facts. [Endosmose.]

When plants are submitted to solutions of various poious agents, they take up very varying proportions. De ssure instituted a series of very careful experiments for purpose of ascertaining the quantities of earthy and aline salts taken up by the roots of plants. For this rpose he prepared solutions of the hydrochlorates, nitrates, phates, and acetates of soda, potassa, and copper, and hav- submitted plants of Polygonum and Bidens to them, he nd that the plants constantly absorbed a larger propor-n of the water than of the salt, and that the salts were en up in different proportions. The salts were not abbed in proportion to their innocuous qualities, as the phate of copper, which was the most poisonous, was abbed in largest quantity. De Saussure concludes that it s not the properties of the salts that determined their ative absorption, but that it depended upon the relative asistence of the solutions. Plants absorb poisons much re quickly when their roots are injured by being torn or t, and do not suffer much by exposure to weak solutions poisonous matters. This is a point of some practical portance, and will explain how it is that vegetation does t suffer when exposed to poisonous solutions.

Another function which has been attributed to the roots that of excretion. Du Hamel first called the attention of tanists to this subject; he found that the roots of plants own in water gave out a brackish secretion, and looked on it as a secretion from the fluids of the plant. Brugans followed up this point, and, in conjunction with ulon, came to the conclusion, from the experiments they ade, that the secretion given out from the roots of plants a process of a similar nature to the rejection of the exnts in animals, and that these secretions acted beneuy in the nutrition of some plants, and injuriously in rs. At the suggestion of De Candolle, M. Macaire secuted some researches on this subject, which were blished in 1832 (*Mémoires de la Société de Genève*, tome p. 287). He confirmed the views of Brugmans and lon, and examined more attentively the nature of the nt excretions given out by plants of different orders. us he found that the Leguminosæ gave out a gum and rbonate of lime; Graminaceæ deposited a matter containing drochlorates and carbonates of alkalis and earths, and ntaining but little gum; Cichoraceæ, an abundant brown atter analogous to opium; Euphorbiaceæ, a gum-resinous atter. It was inferred that these excretions were matters iurious to tne plant, which were thus thrown off from the m. This inference seemed to be confirmed by an experiment of Macaire's, in which, having divided the roots of a plant of Mercurialis annua into two parcels, he plunged the one into a glass with solution of acetate of lead, and the other into a glass of pure water; in a short time it was found that the acetate of lead had not only been taken up by the roots from the one glass, but that it had been excreted by them into the other.

These researches have been considered to offer a satisfactory explanation of the practice of rotation of crops in agriculture; the rotation being *required* on account of the excretions of a plant being injurious to itself, and *beneficial*, as the excretion of one plant is the food of another [Rotation.]

The experiments and conclusions of Macaire and De Candolle have however been called in question by some German botanists. Meyen and Unger object to the employment of a plant like the Mercurialis for determining the absorption and excretion of poison in water, as in the first place its roots must be injured by removal from the soil, and in the second place water is not its natural medium of growth. They employed water plants, and, having placed them in various solutions, could not detect, by the most delicate re-agents, the rejection of any of the absorbed agents. Meyen considers the excreted matters examined by Macaire to be merely secretions resembling those which are found on various other parts of the plant. He gives numerous instances of plants secreting various matters on the surface of their stems, leaves, &c., when they have been grown in soils which are overcharged with the same substance as that which the plant has secreted. The chalk incrustations of Chara, and those of various Saxifrages, with the crystals of salt that occur on the plants on salt-plains, are given as examples. (Meyen, loc. cit., p. 530.)

This is a subject of practical importance, and worthy further investigation. In the late 'Report on Organic Chemistry,' by Professor Liebig, the views of De Candolle and Macaire are adopted. (Liebig's *Organic Chemistry*, p. 165.)

Besides the functions of absorption and excretion, the roots serve other purposes in the economy of the plant. It is by means of the roots that a plant maintains its position in the earth; and if for the increasing nourishment of the plant an increase of the absorbing surface is required, it is no less necessary that, for the purpose of maintaining its stem erect and firm, an extension of its holdfasts should take place. In many instances the root appears to serve merely the purpose of holding the plant in the ground, as in the mosses, and many of the plants belonging to the orders Crassulaceæ and Cactaceæ. By means of the roots the temperature of plants is kept below that of the atmosphere in summer, and above it in winter. This arises from the roots absorbing fluids from some depth below the surface of the earth, where its temperature is not much affected by the changes in the atmosphere. It is thus that the inhabitants of tropical climates are supplied with fruits whose delicious juices, pumped up from the earth, are much cooler than the atmosphere, and thus afford the most refreshing articles of diet.

ROOTSTOCK. [Stem.]

ROPE, a combination of fibres of hemp, or other material, so arranged as to form a flexible and tenacious cord or band; retaining, as far as possible, their collective strength. The name Rope is generally confined to the larger descriptions of cordage, such as exceed an inch in circumference, though the principles of formation are much the same for cordage of every size.

If the fibres used by the ropemaker were of sufficient length, the most effectual way of obtaining their united strength would be to lay them side by side, fastened together at each end, so as to form a bundle or skein; but, as the fibres of hemp do not, on an average, exceed the length of three feet and a half, it becomes necessary, in order to obtain a rope of greater length, so to twine them together that the strength of any single fibre shall be insufficient to overcome the resistance caused by the friction of those surrounding and compressing it; so that it will sooner break than be drawn out from the mass. This requisite entanglement is produced by twisting, which causes the fibres to compress each other; and it not only enables the ropemaker to produce cordage of any required length, but also, by making the rope hard and compact, increases its durability, and enables it to resist the penetration of water, which would rapidly impair its strength. While however some degree of twist is absolutely essential to the cohesion of a rope, any twist beyond that which simply prevents the fibres being drawn out without breaking, is injurious. A skein of fibres, or a rope, may be twisted so hard that any further attempt at twisting would break it, and such a skein or rope will evidently have no power to support a weight, each fibre being already strained to the utmost extent that it will bear. In fact, whatever force is exerted by any fibre in compressing the rest, may be considered the same as a weight hanging on that fibre, and must be subtracted from its absolute strength before its useful effect can be ascertained; the available strength of a rope being the remainder of the absolute strength of its component fibres, after deducting the force exerted in twisting them.

Were a rope to be formed by simply twisting together, in one direction, the whole of the fibres of which it is composed, there would be nothing to prevent its untwisting as soon as left to itself. It is therefore necessary to twist the fibres in comparatively small portions, and so to combine these into a rope that the tendency to untwist in one part may counteract the like tendency in another. Thus the same force which would cause the component parts, if separate, to become loose or untwisted, is employed, when they are combined into a rope, to keep the whole firm and compact.

The first process in rope-making consists in twisting the hemp into thick threads, called rope-yarns. This process, which resembles ordinary spinning, is performed with various kinds of machinery. The common mode of spinning rope-yarns by hand is performed in the rope-ground, or rope-walk, an enclosed slip of level ground six hundred feet or more in length. As many of the operations of a ropery are impeded by wet weather, and by the unchecked heat of the sun, it is not unusual to cover the walk with a slight roof. At one end of this ground a spinning-wheel is set up, which gives motion by a band to several small rollers or whirls. Each whirl has a small hook formed on the end of its axis next the walk. Each of the spinners is provided with a bundle of dressed hemp, laid round his waist, with the bight or double in front, and the ends passing each other at his back, from which he draws out a sufficient number of fibres to form a rope-yarn of the required size; and, after slightly twisting them together with his fingers, he attaches them to the hook of a whirl. The whirl being now set in motion by turning the wheel, the skein is twisted into a rope-yarn, the spinner walking backwards down the rope-walk, supporting the yarn with one hand, which is protected by a wetted piece of coarse cloth or flannel, while with the other he regulates the quantity of fibres drawn from the bundle of hemp by the revolution of the yarn. The degree of twist depends on the velocity with which the wheel is turned, combined with the retrograde pace of the spinner. Great care is necessary in this operation to make the yarn of uniform thickness, and to supply the hemp equally from both sides of the bundle; because, if a considerable body of hemp be supplied to a yarn that is becoming too thin, it will not combine perfectly with it, but form a loosely connected wrapper; and any irregularity in the last-mentioned particular will cause the fibres to bear the strain unequally. The best mode of supplying the hemp is in the form of a thin flat skein. When the spinner has traversed the whole length of the rope-walk (or sooner, if the yarns are not required to be so long), he calls out, and another spinner detaches the yarn from the whirl, and gives it to a person who carries it aside to a reel, while the second spinner attaches his own hemp to the whirl-hook. The hemp, being dry and elastic, would instantly untwist if the yarn were now set at liberty. The first spinner therefore keeps fast hold of it all the while that the reeler winds it up, walking slowly up the walk, so as to keep the yarn equally tight all the way. When it is all wound up, the spinner holds it until another is ready to follow it on the reel. Sometimes, instead of being wound on a reel as they are made, the yarns are laid together in large hooks attached to posts at the side of the walk until about four hundred are collected together, when they are coiled up in a *haul* or skein, in which state they are ready for tarring.

Attempts have been made to introduce machine-spun yarns, in order to avoid the irregularities and defects of those formed by hand, and the recent improvements effected by Mr. Lang, of Greenock, in the spinning of yarns by machinery, are said to succeed very completely. By his process the hemp is more completely heckled, or divided into fibres, than in the common mode of proceeding; and the advantage of each fibre being laid at full length in the yarn, instead of being doubled, as in hand-spinning, is ensured. By a modification of the usual process, the fibres of hand-spun yarns may be laid in at full length, instead of being doubled, as when they enter the yarn by their bight; but experiment has not shown any great advantage from such a mode of spinning. That some improvement in this operation was needful, may be inferred from the result of a comparison between Mr. Lang's machine-spun yarns and those of equal grist spun by hand; the result showing the strength of the former to exceed the latter by fifty-five per cent. This improved process has been adopted by some of the principal rope-manufacturers of Great Britain.

The common size of rope-yarns is from one-twelfth to rather more than one-ninth of an inch diameter: 160 fathoms of white or untarred yarn weighing from two and a half to four pounds.

The next process is warping the yarns, or stretching them to a given length, in order that they may, when formed into a strand, bear the strain equally. When the rope is to be tarred, that operation is usually performed upon the yarns immediately after their being warped; as the application of tar to the yarns previous to their combination is necessary to the complete penetration of the whole substance of the rope. The most common method of tarring the yarns is to draw them in hauls or skeins through the tar-kettle by a capstan; but sometimes the yarns are passed singly through the tar, being wound off one reel on to another, and the superfluous tar being taken off by passing the yarn through a hole surrounded with spongy oakum. Great care is required in this process that the tar may boil neither too fast nor too slow, the common heat being from 212° to 220° Fahrenheit. In Huddart's patent of 1800, the covering of the tar-kettle is recommended, to prevent the escape of the evaporated matter, which would make the tar too thick. The degree of impregnation necessary depends on the kind of cordage; cables and water-ropes needing a considerable quantity of tar, while for standing and running rigging it is sufficient that the yarns be well covered.

In making large cordage, it is not usual to twist togeth at once, as many yarns as would suffice to form a rope the required thickness; a suitable number of yarns, frequently from fifteen to twenty-five, are formed into a strand, and three or more such strands are afterwards combined into a rope. The twist of the strand is in an opposite direction to that of the yarns of which it is composed, in order that, as before mentioned, the tendency to untwist in the individual yarns may be counteracted, and taken advantage of to prevent the untwisting of the strand. In closing or laying the rope, three strands, or sometimes four, in which case a small central strand, or heart, is added, are stretched at length along the walk, and attached at one end to separate but contiguous hooks, and at the other to a single hook; and they are twisted together by turning the single hook in a direction contrary to that the other three, a piece of wood called a *top*, in the fo of a truncated cone, being placed between the strands, and kept during the whole operation gently forced into the angle formed by the strands, where they are united by the closing or twisting of the rope. As the rope shortens in closing, one end only of the apparatus is fixed, the other being on a moveable sledge, whose motion up the rope-walk is capable of regulation by suitable tackle attached to it, or by loading it with weights. The top also is mounted on a sledge, for closing large cordage, and its rate of motion may be retarded, in order to give greater firmness to the twist of the rope. The art of the rope-maker, in this operation, consists in so regulating the various movements that the strands may receive separately at one end just as much twist as is taken out of them at the opposite end, by their twisting the contrary way in the process of combination.

Such is the method, more or less modified by the kind of machinery employed, of forming a *shroud-laid* or *hawser-laid* rope, and such appears to have been the whole process of rope-making until cordage of very large size was called for by the progress of navigation. In making such it was not found advisable to increase the number of yarns in a strand, it being difficult, when their number is very great, to throw an equal strain upon each and thereby obtain th aggregate strength. To obviate this inconvenience, cables, or such large ropes as are said to be *cable-laid*, are formed by the combination of smaller ropes twisted round then axis, just as shroud-laid ropes are composed of twisted round their common axis. As cable-laid e harder and more compact than others, this mode tion is adopted for ropes to be exposed to the water, even though their thickness may not be very

s formed by plaiting instead of twisting are made use me purposes in which pliability is especially needed, ng more supple and less liable to entanglement se of the ordinary make. Such ropes are preferred -lines, clock-lines, &c., and generally where the to pass over pulleys of small diameter.

rds the latter end of the last century much attention cted to the improvement of the rope manufacture, twenty and thirty patents having been taken out subject from 1783 to 1807. The application of ma- instead of manual labour, to its various departments, attended with much benefit. The reader may find d account of many of the ingenious and complicated nces for the purpose, in Chapman's *Treatise on the ive Endeavours to Improve the Manufacture and f Cordage*, 1808.

ully all the yarns composing a strand were of e length, an arrangement extremely defective, as ident that when a number of yarns are stretched th in a cylindrical mass, they will lie at differ- ances from the centre of the cylinder; so that, wisted together, as all the yarns must form spirals ame number of turns, those which are near the forming spirals of large diameter, will be stretched full extent; while those near the centre, forming of smaller diameter, will be less shortened by the of twisting, and must therefore be more or less d up, according to their proximity to the centre of . The first successful attempt to remedy this defect ng the length of the yarns according to their posi- he strand, was that under Captain Huddart's patent since which time many further improvements have ected in this essential point.

opes, which are much used for mining purposes, are rmed of two or more small ropes placed side by side, ed by sewing, lapping, or interlacing with thread or ropes; or of a number of strands of shroud-laid ilarly united. In either case it is necessary that ponent ropes or strands be alternately of a right-hand hand twist, that the rope may remain in a quiescent The latter method of making flat ropes was patented Chapman, in 1807; and he considered it to afford ngest possible combination of rope-yarns, his belts opes appearing to be even stronger than *salvages* are skeins of rope-yarns without any twist) of the mber of yarns. This seeming inconsistency is occa- y the imperfection of hand-spun yarns, because if rn bears its own strain unaided, it will break at its part, while, if combined, the mean strength of each rendered available.

the experiments of Réaumur, recorded in the Memoirs rench Academy of Science for 1711, it appears that a de small hempen cord broke in different places with 67, and 72 lbs., its mean breaking weight being 65 ile the three strands of which it was composed bore , and 35 lbs. respectively; so that the united abso- ength of the strands was 98 lbs., although the real strength of the rope was only 65 lbs., showing strength from twisting equal to 33 lbs. It appears cord used by Réaumur was of very unequal quality, er portion of it broke with 72 lbs., while its strands arately 26, 28, and 30 lbs.; which shows the dimi- of strength from twisting to have been from 84 to the loss being in this instance only 12 lbs.

nore recent experiments of Sir Charles Knowles in- diminution of strength nearly equal in amount to t-mentioned of Réaumur. He found a white or d rope of 3¼ inches in circumference break, on an of several trials, with 4552 lbs.; while the aggre- ength of its yarns, which were 72 in number, and an average 90 lbs. each, was 6480 lbs.; the loss qual to 1928 lbs., or about 30 per cent.

mel, who tried many important experiments in the rds of France, about the middle of the last century, ured to ascertain what degree of twist would pro- e most useful effect. He caused some ropes to be that only one-fourth of the length of the yarns was absorbed in twisting, instead of the usual proportion of one-third. These ropes were tried in shipping, and found to be lighter, thinner, and more pliant than those of the ordinary make. The following statement shows the comparative strength of ropes formed of the same hemp, and the same weight per fathom, but twisted respectively to two-thirds, three-fourths, and four-fifths of the length of their component yarns:—

Degree of twist.	Weight borne in two experiments.	
$\frac{2}{3}$	4098 lbs.	4250 lbs.
$\frac{3}{4}$	4850	6753
$\frac{4}{5}$	6205	7397

The result of these experiments led Duhamel to try the practicability of making ropes without any twist, the yarns being wrapped round to keep them together. These had great strength, but very little durability, the outer covering soon wearing off, or opening at bendings, so as to admit water, and occasion the rope to rot. But while such untwisted skeins of rope-yarns, or *salvages*, are unfit for most of the purposes to which cordage is applied, they are used with advantage for the tackle of great guns and some other purposes for which the greatest strength and pliancy are required.

It has already been intimated that the usual reduction of length by twisting is one-third. This applies to shroud or hawser-laid ropes, those which are cable-laid being further shortened, so that 200 fathoms of yarn are required to make 120 fathoms of cable.

Ropes formed in the most common manner, with three strands, do not require a *heart*, or central strand, because the angles formed by the union of the three cylindrical strands are so obtuse that the pressure of the operation of laying or closing the rope causes the strands to fill them up completely; but when the number of strands exceeds three, a heart is essential to keep them equidistant from the axis of the rope, and to fill up the vacuity that would otherwise be left by their not meeting in the centre. The heart can however add very little to the strength of the rope, as its fibres lie much straighter than those of the outer strands, and, not being able to extend with them when the rope is stretched, are soon pulled asunder.

The following simple rule for calculating the strength of ropes is given by Robison:—Multiply the circumference of the rope in inches by itself, and the fifth part of the product will express the number of tons the rope will carry. For example, if the rope be six inches in circumference, 6 × 6 = 36, the fifth of which is 7¼, the number of tons which such a rope will sustain.

The following rules for calculating the weight of cordage may also prove useful:—

To find the weight of shroud or hawser-laid rope, multiply the circumference in inches by itself, then multiply the product by the length of the rope in fathoms, and divide by 420, the product will be the weight in cwts. Example: to find the weight of a six-inch hawser-laid rope, 120 fathoms long, 6 × 6 = 36 × 120 = 4320, which, divided by 420 gives the weight of the rope, 10 cwt. 1 qr. 4 lbs.

To find the weight of cable-laid cordage, multiply its circumference in inches by itself, and divide by 4. The product will be the weight, in cwts., of a cable 120 fathoms long; from which the weight of any other length may be readily deduced. Example: required the weight of a twelve-inch cable, 120 fathoms long; 12 × 12 = 144, divide by 4, and the product, 36, is the weight in cwts.

Much attention has been devoted to the discovery of the best method of preserving ropes from decay, especially when exposed to the action of water. The operation of tarring, which has been almost universally practised for this purpose, effects it very imperfectly, and materially diminishes the strength of the cordage. Taking the mean of several experiments by Duhamel, it seems that untarred ropes bore a greater weight, by nearly 30 per cent., than those to which the tarring process had been applied; and he states that it is decided by experience that white cordage in continual service is one-third more durable than tarred, that it retains its force much longer when kept in store, and that it resists the ordinary injuries of the weather one-fourth longer. Notwithstanding these facts, it is found that for cables and ground-tackle, which are much exposed to the alternate action of water and air, tarring is a valuable preservative; though cordage that is only superficially tarred is said to be stronger than such as is tarred throughout, and better able to bear the alternations of wet and dry.

The removal of the defects and bad qualities of common tar was the object of a patent taken out in 1802 by Mr. Chapman. Unsuccessful attempts had been made to substitute oils and various fat substances, which would be insoluble in water, for tar: but they had been found to impede the operation of twisting. Chapman improved the ordinary tar, first, 'by boiling the tar in water one or more times, each of which extracts a portion of its superabundant acid, and its mucilage, which contains a disengaged acid;' and, secondly, 'by continuing these processes until the tar has thrown off a larger portion of its essential oil, and becomes more pitchy than usual; and, finally, by restoring the requisite plasticity through the addition of substances less injurious and less volatile, and therefore more continuous, viz. by the addition of suet, tallow, animal oils, or *suitable* expressed oils.' Of the advantages attending this process, an idea may be formed from the subjoined statement of the relative strength of the cordage without any tar, with common tar, and with Chapman's purified tar. The rope was made on the 10th of August, 1802, and contained twelve yarns in each strand; part was tried immediately, and the rest steeped in water for about three months, then removed to a foundry stove for three months, and finally kept at the ropery till November 3, 1803, the date of the second experiment:

Description of rope.	Aug. 10, 1802. Cwt.	Nov 3, 1803. Cwt.	Portion of original strength retained.	
White . . .	33·4	1·9	5·7	per cent.
Common tarred . .	22·2	7·35	33·0	
Tarred with purified tar	29·1	12·35	43·8	

Satisfactory as these experiments appear, Mr. Chapman's process has not been brought into general use.

Sir Joseph Banks had some ropes tarred with *teak* tar, by way of experiment, and found them to be one-third stronger than those done with common tar. Tanning has been tried for the preservation of ropes, but apparently without realizing any decided advantage. The same may, if the writer be not misinformed, be stated of Kyan's process for the prevention of dry-rot. A solution of caoutchouc, in lieu of tar, has been used with success.

Several other kinds of vegetable fibre have been made use of in the manufacture of cordage, and some appear greatly to exceed hemp in strength. In a comparative trial made at Paris between ropes made of hemp and of the aloe from Algiers, the latter was found to bear 2000 kilogrammes, while the former, of equal size, bore only 400. Ropes have been formed also of long wool, but they are only about one-third as strong as the best hempen cordage of the same size. Ropes composed of fibres of hemp intermixed with threads of caoutchouc are very valuable for some purposes, owing to their superior strength and elasticity. Their power of bearing sudden jerks without injury is a highly important property. It may be mentioned that such a rope has been used with the grapnel or anchor of the great Nassau balloon, and found to arrest the balloon without any unpleasant check when the grapnel catches. Ropes made of thongs of ox-hide twisted together, are used in the rope-bridges of Peru, and for some other purposes.

Ropes formed of iron wire have been, within the last few years, introduced to a considerable extent, and have been found to effect a great saving of expense from their durability and superior lightness. From a paper communicated by Count Breunner to the British Association for the Advancement of Science, in 1838, it appears that such ropes had been introduced about seven years before, in the silver mines of the Harz Mountains, and had been found so advantageous as almost entirely to supersede flat and round ropes of hemp in the mines of Hungary, and most of those in the Austrian dominions. The count observes that these iron ropes are nearly equal in strength to solid bars of the same diameter, and equal to hempen ropes of four times their weight. One of them had been in use for upwards of two years without any perceptible wear, though a common flat rope performing the same work would not have lasted much more than one year. The diameter of the largest rope in ordinary use is stated to be one inch and a half, and it is composed of three strands, each containing five wires of two lines in diameter. Great care is observed in the manufacture of these ropes, that the ends of the wires may be set deep in the interior of the rope, and that two ends may not occur near the same part. In use, it is necessary that the ropes be wound on a cylinder of not less than eight feet diameter, and be kept well coated with tar, to prevent oxidation. I case mentioned by Count Breunner, so great a sa power was effected, that four horses were doing a work with a wire rope as six with a flat hempen rope

Prior to the date of this memoir, patents had be tained in this country for the manufacture of wire and they have since been improved and partially upon. The ropes of Mr. Andrew Smith, who appea most in the introduction of wire ropes in this countr been used in mines and shipping for some years; a being adopted for other purposes, having undergone factory trial for several months on the London and wall railway, where the trains are drawn by sta engines and ropes. They are formed in various w cording to their intended use. For standing rigging untwisted wires are employed, bound round with c small hempen cordage saturated with a solution of chouc, asphaltum, or other preservative from rust ropes may likewise be made of straight wires, inte or wrapped with hempen yarn, or sewed between c &c.; but the patentee prefers using them with a twist. Other ropes are formed much in the same those of hemp, the wires taking the place of rope being twisted into strands, and combined into rop hawser-laid and cable-laid. The twisting should no hard as in hempen cordage; and all the wires must tected by an anti-corrosive composition, or by coati tin, zinc, &c. In the patent obtained by Mr. Ne Dundee, for improvements in wire ropes, coating w following mixture is recommended:—Tar, six parts; oil, two parts; and tallow, one part: the whole being together, and applied while hot. In this patent it posed to twist wires round a core, either of wire, h spun yarn, or other material, to form a strand; a such strands round a similar core when there are mo three strands in a rope. For joining the wires, Smith and Newall both recommended twisting the together for a few inches; and the latter also sugg possibility, in some cases, of welding them. Wir may be very conveniently and firmly secured at their passing them through the small end of a conical coll doubling up, or *upsetting*, the ends of the wires, may then be welded into a solid mass, or secured ning melted brass or solder among them. The coll then be attached, in various ways, to anything with w is desired to connect the rope; or they may, as sugge Newall's patent, be screwed together, so as to unite lengths of rope.

Iron is the material usually employed for wire rop copper and other metals may also be used.

The annexed table, showing the comparative weight per fathom for equal strength, gives the r experiments with the wire ropes of Mr. Andrew Smi may serve to show their great superiority to those of which they surpass even in flexibility:—

Hemp Rope. Size.			Patent Wire Rope. Size.			Equa stra
	Weight per fathom.			Weight per fathom.		
Inches.	lbs.	oz.	Inches.	lbs.	oz.	tons.
3	2	4	1¼	1	4	2
4	3	15	1½	1	9	3
5	6	0	1¾	1	14	6
6	9	0	2	2	2	8
7	12	3	2¼	2	9	8
8	14	3	2½	4	1	9
9	19	6	3	5	4	15
10	25	0	3½	7	1	24
11	30	0	4	11	6	29
12	36	8	4½	15	12	35

RÖRASS. [TRONDHEIM.]

RORQUAL. [WHALES.]

ROSA (from the Latin *Rosa*, through the of the French *Rose*; the Latin 'Rosa' and the Gree are evidently the same), the name of the most sally admired and cultivated genus of plants form type of the natural order Rosaceæ.

The rose was known in early times, and was as favourite among the nations of antiquity as it is in times. The rose is found generally in almost every of the northern hemisphere, both in the Old an World; from Sweden to the north of Africa; fr tchatka to Bengal, and from Hudson's Bay to the tains of Mexico. It is not found in South Ame in Australia. All the species are included between

° N. lat. It is found more generally on dry and free soils n on those which are wet and tenacious. In the north Europe it occurs with single flowers, but in Italy, Greece, d Spain more frequently double.

The characters of the genus Rosa are—calyx five-parted, be fleshy, urceolate; petals five; stamens numerous, tached to the calyx and corolla; ovaries attached to the er surface of the tube of the calyx; style long, stigma jecting beyond the mouth of the calyx; achenia numerous, hard. They are mostly shrubs with alternate pinnate aves and beautiful odoriferous flowers. There are few tter marked genera amongst plants than this, but as of all ants it has been the greatest favourite, and thus surrounded the greatest variety of external influences, its species and rieties are the most difficult to distinguish. The best ar- ment of this genus is that of Dr. Lindley, in his *Rosarum nographia*, published in 1820. He arranges the species der eleven divisions, the first of which, including but one ecies, has since been made into the genus Lowea. We all here give the remaining divisions, and point out the ecies which, on account of their ornamental flowers or es, are most frequently cultivated.

1. FEROCES, with branches permanently tomentose and ked fruit. They are generally low shrubs, remarkable r thick hoary branches clothed with numerous prickles; d hence their name. There are only three species belong- g to this division, of which *Rosa ferox*, the hedgehog se, is most common. It is a beautiful plant, with fine owy crimson blossoms appearing early in the season.

2. BRACTEATÆ. The species of this division have not only eir branches, but also their fruit clothed with a persistent mentum. They have mostly bright green leaves, and eir organs of fructification are in the highest state of velopment of any of the genus. They belong to the class evergreen roses. *R. bracteata*, the Macartney rose, is a tive of China, and was introduced into this country by rd Macartney. It has upright branches, 5-9 leaflets, out prickles, with large white terminal solitary flowers, d large globose orange-red fruit. It is a handsome plant, wering abundantly late in the season. It is however nder, and is best grown against a wall. *R. microphylla*, nall-leaved rose, resembles *R. bracteata*, but differs in g smaller, and having prickly fruit and ovate obtuse es.

3. CINNAMOMEÆ, distinguished by their long lanceolate ets, without glands, bracteated flowers, and delicate disk, little thickened. The shoots are either with or without tæ. There are several species in this division, but com- aratively few are known out of the herbarium. *R. lucida*, e bright-leaved rose, is not uncommon in gardens, pro- ucing its fine red flowers in the latter months of the sum- er and in autumn. *R. laxa*, loose or spreading Carolina se, is frequently found cultivated. *R. Carolina*, the true arolina rose, is a native of the marshes of North America, nd is often found enlivening our shrubberies by its beau- ful crimson blossoms when few other flowers are to be en. It is known by its narrow convoluted stipular lan- eolate leaflets and entire spreading sepals. It attains a eight of about six feet, bearing numerous flowers on short eduncles.

4. PIMPINELLIFOLIÆ, branches either crowded with early equal prickles or unarmed; leaflets ovate or oblong; racts absent; sepals connivent and persistent. Although division approaches the last in artificial characters, it is sentially different in habit. *R. spinosissima*, the Scotch se, is a dwarf, compact, green bush, with creeping roots; has unequal prickles, flat, glabrous, simple serrated leaf- ets, and small, solitary, white, or bluish-coloured flowers. t is found native in the mountainous districts and sea-coasts Europe, and also in the Caucasus. It was the only ound by Sir W. Hooker in Iceland. A great number of ties are found in the gardens of Britain, produced from wild plant found in the North of England and Scotland. ey produce an abundance of seed from which varieties be easily raised. The seeds should be sown in pots in ber, when they will produce plants in the spring, which om the next season. *Rosa sulphurea*, the double yellow , is one of the most splendid plants in the genus. It never been known to produce single flowers. Its native try is still unknown; it was procured by Clusius from of his correspondents in the East, of whom he made ry concerning this plant, after having seen a model of some little paper gardens sent from Constantinople. It has linear divaricating stipules, dilated at the apex, glaucous leaflets, and a hemispherical tube. This plant requires some care in culture; it only flowers in open airy situations, and requires to be freely watered whilst in flower. It is grown in greater perfection in Italy than in this country. As its flowers are double, it never produces seeds. *Rosa alpina*, the Boursalt rose, is a native of the Alps of Austria, the South of France, Silesia, and Bohemia. It is destitute of prickles or setæ, has pendulous elongated fruit, hispid peduncles, and solitary, erect, blush-coloured flowers. It attains a height of seven or eight feet, and is well adapted for a pillar rose.

5. CENTIFOLIÆ, clothed with bristles and prickles; flowers bracteate; leaflets oblong or ovate, rugous, disk thickened, closing the throat; sepals compound. This division comprehends those species which have ever been most interesting to the florist, as also probably those that were earliest known. Although the garden varieties of this division would probably amount to several hundred, there are only three species.

Rosa centifolia, the hundred-leaved cabbage or Provence rose, is known by its large unequal prickles, glandulous leaflets, pendulous flowers, and oblong fruit. This rose has been said to be a native of France, but this is doubtful. It has been found wild in thickets on the eastern side of the Caucasus. It is the same plant as the *R. provincialis* of Miller, under which, name most of the varieties in our gardens have been propagated. Seventy or eighty varieties of this rose have been named. They are all characterised by their large pendulous fragrant flowers, seated on slender footstalks, which, when in bloom, have a peculiar graceful appearance. A botanical variety of this species, the *R. centifolia muscosa*, is the parent of the beautiful family of moss-roses. When this variety was produced or discovered is not known, but that it is nothing more than a variety of *R. centifolia* is proved by the fact that plain and moss roses are often seen on the same bush. When moss-roses are removed from our northern climate to Italy, the mossiness disappears. They are universal favourites, and between twenty and thirty garden varieties are enumerated. They are of almost all colours, from white to a dark rich crimson. They flower best in a light soil. The white varieties ought to be grown on a stock of the common dog-rose. They are all adapted for standards. If a succession of blossoms be required throughout the summer, they should be pruned in October and May.

Rosa Gallica, the French rose, has equal small prickles, erect flowers, ovate sepals, and globose fruit. It is found wild about Montalbanum, Walzenberg, and Geneva, also in Austria, Piedmont, and the Caucasus. This is supposed to be the species to which Pliny refers (*Hist. Nat.*, xxi., 18, 25, 72, 73). The *R. pumila* of Jacquin is a variety of this species. Upwards of one hundred varieties of this rose are found cultivated in gardens. They have stiff erect shoots, with brilliant-coloured flowers seated on short erect flower-stalks. The spotted, striped, and marbled roses belong to this species. The York and Lancaster rose is a variety possessing white and red coloured flowers. In the garden they will flourish as bushes on their own roots, or they may be grafted or budded on short stems, or grown as standards. In winter pruning, the stray shoots should be shortened to within six or eight buds of the bottom, those that are weak to within two or three buds.

A great number of varieties of roses found in gardens are hybrids between *R. Gallica* and *R. centifolia*. They mostly combine the long graceful shoots of the last with the rich crimson hues of the first. Hybrids are also produced between *R. Gallica* and *R. Indica*, but differ from the last in not being perpetual. They have a pleasing glossy sub-evergreen foliage. Of these varieties that known by the name of George the Fourth is one of the finest.

Rosa Damascena, the Damask rose, has unequal prickles; the larger ones falcate, sepals reflexed, fruit elongated. This plant is supposed to have been originally brought from Damascus, and to be a native of Syria. It is much cultivated in gardens, and has not fewer varieties than the two last. The monthly blush, blush damask, red and white monthly, and four seasons, are among the handsomest and best known varieties. The blossoms are exceedingly fragrant. Immense quantities of them in pots are sold weekly in the flower-markets of Paris.

6. VILLOSÆ. Root-shoots erect; prickles nearly straight; leaflets ovate or oblong, with diverging serratures, sepals

persistent, connivent; disk thickened, closing the fauces. The best known species of this division is the *R. alba*, white rose; it has rugose glaucous leaves, with simple serratures and acicular unequal prickles, by which it may be distinguished from both *R. tomentosa* and *R. canina*, with which it is liable to be confounded. It is a native of Piedmont, Cochin-China, Denmark, France, and Saxony. Its flowers are very large, exhaling a delicious fragrance. A number of handsome varieties are found in gardens, as the maiden's blush, double, semi-double, single blush, white, &c. In the garden the varieties of this species, varying in the colour of their flowers from pure white to vivid rose, contrast well with beds of darker varieties. They make good standards, bear close pruning, and blossom abundantly. *R. Hibernica*, the Irish rose, belongs to this division, and is interesting to the botanist as being entirely confined to Ireland.

7. RUBIGINOSÆ, unequal and sometimes bristly prickles, ovate or oblong leaflets, with glands and diverging serratures, persistent sepals, thickened disk, and arched root-shoots. To this division belongs the eglantine, or sweet briar (*Rosa rubiginosa*). It is common in Britain in bushy places on a dry gravelly soil. From its extensive diffusion it has been subjected to a variety of changes in external character, and as a consequence of this has received a great variety of names. It is characterised by hooked spines, opaque rugous leaflets, and hairy peduncles and calyces. The Austrian briar (*Rosa lutea*) is nearly allied to the latter, but is known by its foliage existing only at the extremity of the branches, prickles under the stipulæ, and leaflets hollow. The most brilliant yellow roses are produced from this species. They require a moist soil and dry pure air, and will do without severe pruning.

8. CANINÆ, with equal hooked prickles; oval eglandulose leaflets, with connivent serratures, deciduous sepals, and thickened disk closing the throat. To this division belong many of the varieties called autumnal or perpetual roses, on account of their blooming late in the season and continuing in flower a long time. Most of the perpetual roses are highly fragrant, and more so in the latter than the early months of the year. The soil in which they are grown cannot be too rich. In order to secure full blossoms in the autumn, all the flower-buds should be cut off in June, the shoots shortened, and the plants well watered and manured. They should never be planted on dry lawns, and wherever placed they should be manured every year. By retarding and forcing them, these roses may be made to blossom eight months in the year. Of the roses in this group that have afforded varieties for the garden, the *R. Indica*, Chinese rose, stands first. It is known by its whitish green or purple stem, stout falcate distant prickles, stamens bent inwards, and semi-double usually red flowers. It is found wild in China about Canton. It blossoms six or eight months in the year. The varieties of this plant are quite hardy; their colour varies from a delicate blush to a most brilliant red. There is a hybrid variety between this species and the *R. odorata*, which is well known in gardens under the name of tea-scented China rose (*Rosa Indica odorata*). This rose is the parent of a great number of sorts in gardens. They are the roses which are most commonly sold in Paris in little bouquets wrapped round with coloured paper. Most of the varieties of this plant are French, and only a few will grow in this country; they are fleeting in duration, and will not bear the cold well. They blossom best in August and September. When grown on their own roots in moist soils and situations, they must have a raised border in some warm and sheltered place: the border should be a compost of rotten manure or leaves, light loam, and sand, in equal parts, and raised about eighteen inches above the surface. When grown as low standards, they should be taken up in November.

The Bourbon rose (*R. Bourboniana*) is a natural hybrid between *R. Indica* and a variety called red four-seasons. This hybrid was found amongst a number of the latter plants in a hedge in the Isle of Bourbon. It was brought to Paris, and has since produced many beautiful varieties. The flowers of this rose are very handsome, pendulous, with fine colours, and a most delicious fragrance. The varieties are not yet much known to English cultivators. They form a pretty addition to clumps of roses, or may be grown in beds as standards and as pillars. Mr. Rivers, in his 'Rose-Amateur's Guide,' says, 'I consider the culture of these roses only in its infancy; we shall ultimately have the richest hues combined with perfection of form, and the complete plenitude of their flower.'

The Noisette rose was grown from seeds produced from *R. moschata* impregnated with *R. Indica*. It was first reared in America. In many of the sorts the clustered habit and peculiar fragrance of the musk-rose prevails; whilst in others the perfume and magnificent flowers of tea-scented roses are apparent. They form an elegant section of flowers for the rosarium, producing sometimes as many as seventy or eighty flowers in a corymb. They are all very hardy.

Rosa Lawranceana, the miniature or Lawrance rose, named after Miss Lawrance, who published a collection of drawings of roses, belongs to this division. It was first brought from China, and is probably only a dwarf variety of *R. Indica* or *R. semperflorens*, which it closely resembles in structure. All the varieties are known by their diminutive size; some of these little 'fairy roses' produce blossoms when they are not more than six inches high. In cultivation they will not bear moisture, requiring in most soils a very dry warm raised border. They form elegant ornaments for the drawing-room. *R. canina*, the dog-rose, is one of the most common species of the division in this country, and from its varying characters has given origin to a great number of names supposed to represent species. This is the species used for making conserve of roses.

9. SYSTYLÆ, styles cohering in an elongated column; stipules adnate. The habit of the plants of this division is nearly the same as that of the last. *R. arvensis*, the field or white dog-rose, belongs to this group. It is a very common plant in many parts of England, adorning the hedges with its elegant snowy blossoms. It has cord-like shoots, unequal falcated prickles, leaflets glaucous beneath; diverging stipules, and ovate crimson fruit. The varieties of this and allied species, as *R. multiflora* and *R. sempervirens*, produce the climbing roses of the garden, of which there are a great number now to be had. They can be grown as underwood, and nothing would add more to the beauty of a shrubbery than the introduction of the undergrowth of the varieties of these roses. They grow with most vigour when prostrate; but can be carried up frames, which may be made into various shapes for the purpose of effect.

R. moschata, the musk-rose, is one of the oldest inhabitants of our gardens. It is found native in the North of Africa, and in the temperate and warm provinces of Spain. It has slender recurved prickles, the surfaces of its leaflets of different colours; acute narrow stipules, with numerous white fragrant flowers. It is an autumnal rose, and is very generally cultivated on account of the beautiful musk scent of its flowers. It is a tender plant, and our winters are generally too severe for it. Its bunches of flowers are frequently very large, requiring props for their support. The musky odour is most powerful at night. It is supposed to be the famous rose of Persia, in the branches of which the poets of that country delight to describe the *bulbul* (singing nightingale) pouring forth her music.

10. BANKSIANÆ, nearly free subulate stipules, usually deciduous; ternate shining leaflets and climbing stems. This is the last division of the species of roses. The most remarkable species in this group is the *Rosa Banksiæ*, Banksian rose, named after Lady Banks. It is a native of China, and has very numerous double sweet-scented nodding flowers, which are arranged in umbel-like corymbs. It is one of the most elegant plants of the genus; it grows well in the open air, but is tender, and requires to be grown against a wall or in a sheltered situation. It grows and blossoms better in a dry than in a moist situation. The branches should never be shortened, as it prevents their producing flowers. The seeds are not perfected in this country, but are in Spain and Italy.

The rose is more frequently cultivated as an ornament, than for its applications to medicine or the arts. It has however astringent and tonic properties which render it useful in medicine. In the East it is extensively grown for the purpose of procuring, in a variety of ways, the volatile oil which gives it its delicious fragrance. For these purposes the species that are mostly cultivated are *R. moschata*, *centifolia*, and *damascena*, from all of which the attar, butter, essence, or oil of roses may be procured in considerable quantities. [ATTAR.] The attar of roses forms an object of considerable commercial importance on the coast of Barbary, in Syria, Persia, India, and various parts of the East. Many other perfumes are made from roses, and are nsumed in large quantities, as rose-water, vinegar of roses, irit of roses, honey of roses, &c.

For those who would wish to know more of this favourite nus of plants, we append the names of some of the works that have been exclusively devoted to its hisy and illustration:—Lindley, 'Monographia Rosarum,' 20; 'A collection of Roses from Nature,' by Miss Lawnce, 1799; 'Les Roses,' by Redoute and Thory; 'L'Hise Naturelle de la Rose,' by Guilleman, 1800; 'Prodrome Monographie du Genre Rosier,' by Thory, 1820; ose-Amateur's Guide, with descriptive catalogue of ses,' by T. Rivers of Sawbridgeworth, 1836 (a very exllent account of the garden varieties and their cultivation); e article 'Rosa,' in Rees's 'Cyclopædia,' by Sir J. B. nith; 'Genus Rosa,' in Miller's 'Gardener's Dictionary,' Don.

ROSA, Medical Properties of. Of the numerous ecies or varieties of this genus, three only are indicated in e 'Pharmacopœia' as the sources of the officinal articles; t a very considerable number of them contribute the different materials. Those indicated in the 'Pharmacopœia' : the Rosa canina, or common dog-rose; Rosa gallica, French or red rose; and Rosa centifolia, the hundred-ed or cabbage rose. Of the first, the so-called fruit s) is the officinal part. This is truly the enlarged pertent calyx, enclosing the real fruits, which are numerous all achenia, clothed, as well as the inside of the calyx, h silky hairs. The hairs and achenia are to be carefully noved, and the fleshy calyx beaten into a pulp, to which dually thrice their own weight of white sugar is to be led. The employment of heat in the preparation of this serve, though directed by the 'Pharmacopœia,' is better ted. The pulp consists chiefly of malic and citric s, in combination mostly with some salts, tannin, ins, a small quantity of volatile and fixed oils, fibre, and arge quantity of sugar. The action on the stomach is tly refrigerant and aperient, its sweetness recomding it to children, and as a vehicle for other medicines. is apt to candy or concrete by keeping. The fresh hips, ed from the fruits and hairs, bruised, and having a little gar added, yield, by pouring warm water upon them, a oling mildly astringen drink, which would be grateful the poor suffering from autumnal fevers.

The petals of both the Rosa gallica and R. damascena are pplied to herbalists for medical and chemical purposes. e latter is most extensively cultivated at Mitcham for the ndon market. The buds are collected before they expand, the calyx and lower part of the petals, termed claws, g cut off, they are quickly dried. If this last process be lucted slowly, it impairs both their astringency and fine dena colour. Their astringency and odour are greatest en collected before the process of anthesis, or bursting of anthers. About 2000 flowers yield 100 lbs. of fresh pe- which when dry weigh only 10 lbs. After drying the faint, the taste bitter and astringent. As by expo- e light and air they lose their fine colour, and soon come mouldy or worm-eaten, they must be carefully prerved in well-stopped bottles or canisters.

According to the analysis of Cartier, they consist of vola- oil, colouring matter, fatty matter, gallic acid, tannin, n, soluble salts of potash, insoluble salts of lime, , and oxide of iron. The tannic and gallic acids are cause of the astringency, and also of the dark colour, ich results on adding a solution of any salt of iron to an on of roses, and of a slight precipitate when a solu- of gelatine is added to the infusion. The property of g a black compound with iron is taken advantage of ting the petals with cloves and other spices in an mortar, till a thick black paste is formed, which on exposure to the air, and is then polished or , so as to form the perfumed beads for necklaces or es. The petals of R. centifolia are often preferred. exact nature of the colouring principle has not been rtained, but it is not owing to oxide of iron, as the ntity of iron is much greater in white than red roses, r having obtained from 1000 grains of white roses 99 of ashes, containing 12·4 of iron, while a similar quan- red roses yielded only 50 grains of ashes, containing 4 grains of iron.

he petals of the Rosa damascena are the most laxative, t perhaps the R.[illegible]mperflorens, but it is seldom that are used as aperients, though the petals of the R. formed into a confection which has the advantage over that of the R. canina, inasmuch as it neither candies nor becomes mouldy. In forming this or the other preparations, a stone (not an iron) mortar must be used. The chief employment of the conserve of the Gallic rose is as a vehicle for other medicines and as the basis of blue pill.

The infusion of roses is made by pouring boiling distilled water on the petals, and adding dilute sulphuric acid, which are allowed to macerate for six hours, and when strained, refined sugar is to be added. The vessel in which this process is conducted should not be glazed with lead. By this means is obtained an elegant, fragrant, and mildly astringent tonic and refrigerant liquid, which is of great utility, either alone, especially to check the wasting perspirations of consumption, or as a vehicle for most salts which are formed with sulphuric acid. It is likewise employed as a gargle, alone, or with various adjuncts, one of the best of which is the mel rosarum, or honey of roses, made with the petals of this kind of rose. A syrup is sometimes made with them, which is only used to sweeten and colour other medicines.

The Rosa centifolia, hundred-leaved rose, especially the variety of it termed the *Provence* or *cabbage rose*, is cultivated both on account of its exquisite perfume and the uses to which it, with its products, can be applied. The petals are the officinal article. They are directed to be collected when the flower is full blown; and to be plucked off, not allowed to fall off. It is better to collect them before the flower is fully expanded, as the odour rapidly diminishes as the anthesis proceeds; 100 parts dry into 18 only. They are to be dried in the open air, and not in an oven, as desiccation impairs their fragrance, while it heightens that of the R. gallica. When dried, they are of a pale red, with a faint rose odour and an astringent taste. They easily part with their colour, and are therefore to be protected from air and light: if salted, they may be preserved unimpaired for years. With the addition of salt, pepper, and cloves, they are used to form the rose-pots which adorn the apartments of the rich, but which may equally be made to contribute to the enjoyment of the poor, as the expense of this perpetual feast is so small as not to be felt by the poorest occupier of a room. The colouring matter extracted by alcohol furnishes a most delicate test for the presence of alkalis.

A syrup is also made of this sort, but the chief use of it in England and France is to yield by distillation rose-water, the medical properties of which are too slight to merit further notice here. In hot countries a large quantity of volatile oil is elaborated by the flowers of this and several other species, such as the rosa moschata, rosa damascena, and in Italy the rosa sempervirens, which constitutes the *athar*, *ather*, *attar*, *utter*, or *otto* of roses. Attar o roses is said by Donald Monro to be procured by merely macerating the petals in water. The failure of Trommsdorf to procure it by this means is not conclusive against its accuracy, since less oil is found in cold countries, and it is less easily separated. But most writers describe it as being the result of distillation, and this is the mode generally followed. The quantity obtained varies with the season and the care observed in the process. Bishop Heber observes, 20,000 pounds of rose-leaves yield attar equal in weight to a rupee. Jackson states that from one lac of roses it is generally calculated that 180 grains, or one tolah, of attar can be procured. Polier states that to procure something less than three drachms of attar from 100 lbs. of rose-leaves, the season must be very favourable and the operation carefully performed. The same authors tates that 4366 pounds of rose-leaves yield by repeated distillations 8 ounces of attar. The oil concretes and floats on the surface of the distilled water when cold. Even in England a crystalline volatile oil with a faint odour of attar (English attar of roses) is frequently obtained when distilling rose-water from the petals of R. centifolia. The high estimation in which this perfume is held, and the price which it bears, offer great temptations to increase the quantity of oil. In some parts of India this is done by mixing the freshly plucked rose-leaves with the seeds called Geuzely, and also those of a sort of Digitalis termed Sisama, in successive layers, allowing them to remain ten or twelve days, and then placing the seeds in contact with fresh rose-leaves; and after repeating this process eight or ten times, the seeds are subjected to pressure. A dirty oil results, which on standing for some time forms several distinct layers, the upper one of which is sold as rose-oil. The Chinese adopt a similar expedient. Genuine attar of roses at all temperatures below 80° Fahr. is a crystalline solid, and generally colourless. At 90° Fahr. its specific gravity is 0·832. It consists of two volatile principles, one solid, the other liquid, at ordinary temperatures, in the proportion of one part of the first to two of the latter. The first is a stearopten, the last an eleopten. The entire oil, according to Göbel, consists of carbon 69·66, hydrogen 16·06, and oxygen 14·28; but the analyses of Saussure and Blanchet do not correspond with this: Saussure says it contains nitrogen also. This proves the variable nature of the article sold as attar, which is almost constantly adulterated. When mixed with any essential oil, such as that of an Indian grass (Andropogon, Acorus Calamus), or of sandal-wood, or of rhodium (from Convolvulus Scoparius), the sophistication is not easy of detection, but if with fixed oils, blotting-paper will reveal their presence. Alcohol is no criterion of the purity; for when castor-oil has been used to adulterate the attar, it is as soluble as the rose-oil in alcohol of sp. gr. 0·815. Attar of roses is chiefly brought from Constantinople and Smyrna. It is subject to a duty of 1*s.* 4*d.* per lb. In 1838, 973 lbs. and in 1839, 754 lbs. paid the duty.

(Pereira's *Materia Medica.*)

ROSA SALVA'TOR was born at Renella or Arenella, a village in the environs of Naples, on the 20th of June, 1615, and he was originally intended for the church. Whilst yet a boy he manifested a strong propensity for drawing, and in order to cure him his parents procured his admission as a student in the college of the congregation of Somasca in Naples: but before the expiration of the usual period of residence, he was either expelled or voluntarily quitted the college. On his return to Renella he devoted his time to the study of music, and cultivated his talent for poetry, and on the marriage of his eldest sister with Francesco Francanzani, a disciple of the Spagnuoletto school, he attended the studio of that artist. He also studied from nature in oil-colour, and in 1633 went from Naples on a tour through the wild scenery of La Basilicata, La Puglia, and Calabria. During his absence he associated with banditti. At this period Salvator seems to have fostered and matured his taste for romantic scenery, and the studies which he made of groups and single figures whilst with the bandits served him as valuable materials for his future works. Soon after his arrival at Renella his father died, leaving the family dependent upon Salvator, who was then certainly not more than eighteen years of age, for their support. To perform this duty, he executed with great rapidity subjects on primed paper, his poverty not enabling him to purchase canvas, and sold them to the dealers who keep the stalls in the Strada della Carità in Naples. One of these, representing the story of Hagar and Ishmael, was seen and purchased by Giovanni Lanfranco, who was then in the city decorating the church of Gesù Nuovo for the Jesuits. The admiration of that painter was valuable to Salvator, for his works rose in price accordingly, but at the same time it laid him open to the malice and envy of other Neapolitan artists. They ridiculed the efforts of a man who had been obliged to seek the patronage of mean dealers, and he retorted upon them in epigrams, and satirical verses which he set to music and sang. He however obtained the friendship of Aniello Falcone, an eminent painter of battles, the first and best of the pupils of Spagnuoletto, who gave him instruction, and after a time introduced him to the notice of that great painter, from whose advice and practice he derived great benefit.

On the invitation of his former friend, who was in the establishment of the Cardinal Brancaccio, he repaired to Rome. Here he enjoyed the patronage of the cardinal, who took him to the bishopric of Viterbo, where he painted an altar-piece representing the incredulity of St. Thomas, for the Chiesa della Morte, and other works. In 1639 he went again to Rome. The reputation of Salvator was now at its height; he was esteemed as a painter, a poet, a musician, and an actor, for the plays which he performed were written by him, the music composed by his hand, and the principal character represented by himself. As an artist, he was most extensively patronised, and at very high prices. In 1647, on the breaking out of the revolt of Masaniello at Naples, Salvator Rosa returned to that city, and became a member of the band. On the suppression of the revolt, he made his escape from Naples in the train of the Prince Carlo Giovanni de' Medici, with whom he went to Florence, where he was employed by the grand-duke to paint in the Pitti Palace. Here he associated with the literati and the principal nobility. After remaining several years at Florence, he returned to Rome, and was again extensively employed. In 1663 he executed three pictures for the exhibition of San Giovanni; one was Pythagoras on the sea-shore, the second was the same philosopher recounting his visit to the infernal regions, and the third the Prophet Jeremiah thrown into a pit for having prophesied the fall of Jerusalem; and soon after he produced his most celebrated picture, the Catiline Conspiracy. In 1668, at the annual exhibition of the Feast of San Giovanni Decollato, he placed his Saul and the Witch of Endor in competition with the works then shown of the elder masters. He did not execute many important works after this, and died of an attack of the dropsy, on the 15th of March, 1673. He was buried in the vestibule of the church of Santa Maria degli Angioli, which was erected over the ruins of the baths of Diocletian, by Michel Angelo. Salvator Rosa left one son, by Lucrezia, a mistress, who accompanied him from Florence, and to whom he was married shortly before his death.

Rosa possessed great invention, and had a wonderful facility of execution. He is superior when he confines his efforts to works of the easel size, and his figures are then correct in drawing and spirited in design. Such is the case in his picture of Atilius Regulus, formerly in the Palazzo Colonna at Rome, and now in the possession of the earl of Darnley. Of his landscapes, it may be observed, that he wholly rejected the simplicity and amenity cultivated by Claude and by Poussin, and indulged in gloomy effects and r forms; nor are his sea-pieces less forcible; in them he represents the desolate shores of Calabria, and not unfrequently adds interest to his works by the terror of wreck. According to Sir Joshua Reynolds, he gives a peculiar cast of nature, which, though void of grace, elegance, and simplicity, though it has nothing of that elevation and dignity which belong to the grand style, has yet that sort of dignity which belongs to savage and uncultivated nature; and Fuseli says, that though Salvator R was without choice of form in design or much propriety conception, and though his talent was better adapted t smaller dimensions, he could fill a large canvas with t effects, of which the Conspiracy of Catiline, formerly in the Casa Martelli, and now at the Pitti Palace at Florence, is a powerful instance. The subject of the Witch of Endor has been by some persons extravagantly praised, but the last-named acute critic has observed that the toads, bats, skeletons, and other accessories are vainly accumulated to pali the want of dignity and pathos in Saul, and of sublimity in the apparition. He however admits that in landscape Salvator was a genius.

There are a great number of his pictures in England, several of which are in the collections of the Marquis of Westminster, Lord Francis Egerton, the Duke of Devonshire, the Earl of Darnley, the Duke of Buckingham, and others. The Finding of Moses, at Stowe, was purchased from the Orleans collection for 2500*l.* His etchings consist of about ninety in number, executed in a spirited and masterly style. The chiaro-scuro is admirably managed and the heads of the figures are full of expression. His monogram is composed of an S and an R combined, the former letter drawn over the straight line of the latter.

Some of the music-books of Salvator Rosa were, amongst other musical manuscripts, purchased by Dr. Burney, at Rome, and amongst many airs and cantatas by different masters there were eight entire cantatas, written, set, and transcribed by the painter himself. From the specimen of his talents for music there given, there seems to be no doubt that he had a truer genius for this science, in point of melody, than any of his predecessors or contemporaries, and there is a strength of expression in his verses which must always place him above the middle rank of poets. To his other accomplishments he added architecture, which, according to Pascoli, he understood perfectly, and he excelled as a comic actor, an improvisatore, and a performer on various musical instruments. (*Biographie Universelle*; *Life* . *Times of Salvator Rosa*, by Lady Morgan; Bryan's Strutt's *Dictionary*, &c.)

ROSA DA TI'VOLI. [Roo

ROSA'CEA. (Malacology.) [DIPHYDES, vol. ix., p. 10.

ROSA'CEÆ, a natural order of Polypetalous ex

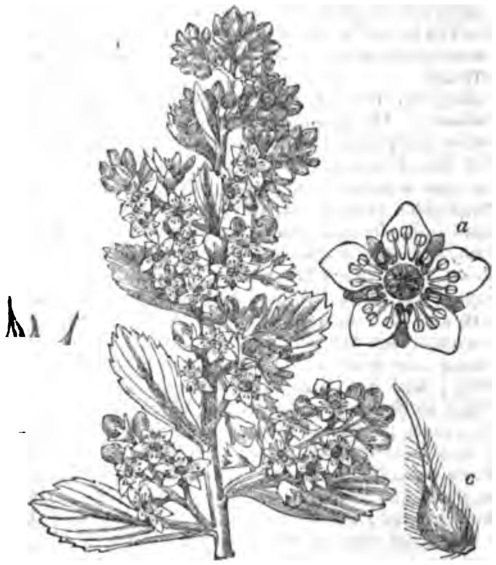
l- or 5-lobed calyx; 4 or 5 regular petals; indefinite
'nous stamens; exalbuminous seeds; and alternate
ate leaves. The plants of this order are allied to
obalanaceæ, from which they may be distinguished by
styles proceeding from the side of the ovarium near the
and not from the base, and by their regular petals
amens. They are distinguished from Fabaceæ (Le-
sæ) by their regular petals and stamens, and espe-
by the odd segment of the calyx being posterior, and
terior, as in that order. The genera of this order may
ranged under four groups or suborders, the prin-
distinctions of which will be seen in the following
is:—

arpels numerous.
    Ovaries superior. ROSACEÆ (proper).
    Ovaries inferior. POMEÆ.
arpels solitary.
    Fruit a drupe. AMYGDALEÆ.
    Fruit a nut. SANGUISORBEÆ.

aceæ proper include the true Roses (Roseæ), the
efoils (Potentilleæ), the Spiræas (Spiræeæ), and the
das (Neuradeæ). They are herbaceous plants or
. This family includes about 570 species and 20
, principally inhabitants of the temperate and cold
of the northern hemisphere of the New and Old World;
few are found on high land within the tropics, and a
number in the southern hemisphere. None of the
of this section of the order are unwholesome; they
aracterised by the presence of an astringent principle,
has led to the use of many of them in medicine.

eæ are known by the adhesion of their ovaries to the
of the calyx, forming the fruit called a pome. Their
are always in pairs. The tendency of the flowers of
mily to revert to their normal state frequently affords
tive examples of morphological changes. The fruit
y of the species contains a considerable quantity of
acid, which gives to the fruit its peculiar flavour. The
pear, medlar, quince, service-tree, and mountain-ash
to this family. They are inhabitants of Europe,
ern Asia, the mountains of India, and North Ame-

gdaleæ have but a single carpel, which, when ripe,
upe; but they are also distinguished amongst Rosaceæ
ir leaves containing hydrocyanic acid, and their
ielding gum. They are natives exclusively of the
rn hemisphere, where they are found in cold or tem-
climates. Many of the species are poisonous, on ac-
of the hydrocyanic acid they contain. They yield
r some of our most valued fruits, as the peach, nec-
plum, apricot, cherry, and almond, which last is
l of the Amygdalus communis.



(Spirea argentea.)

wer, showing the perigynous arrangement of the stamens; *b*, fruit,
its apocarpous structure; *c*, one of the follicles separate from the

isorbeæ are not only known by their solitary car-
ut they are destitute of petals, and have a hard thickened calyx. They are found wild in heaths, hedges, and exposed places in Europe, North and South America beyond the tropics, and the Cape of Good Hope. Their principal property is astringency, and some of the species may be used as fodder.

ROSACIC ACID, a name given by Prout to a peculiar acid which he imagined to exist in the lateritious sediment deposited in urine during fever. Dr. Prout is of opinion that it contains some purpurate of ammonia, and consequently, if this opinion be correct, no such substance as the rosacic acid exists.

ROSALI'NA. [FORAMINIFERA, vol. x., p. 348.]

ROSAMOND, FAIR. [HENRY II.]

ROSARIO. [MEXICAN STATES.]

ROSARY. [BEADS.]

ROSAS, a small seaport town of Spain, in the province of Gerona in Catalonia, not far from Cape Creus, on the north side of a gulf in the Mediterranean known as the Gulf of Rosas; in 42° 15′ N. lat. and 3° 11′ E. long. Rosas was founded by a colony of Rhodians, who called it Rhodope. (Strabo, p. 160.) But the reading in this passage of Strabo is evidently corrupt, and should be Rhode. The town is mentioned under the name of Rhode by Stephanus Byzantinus (*v.* Ῥόδη), by Livy (34, c. 8), and by Mela (2, c. 6). It has a good and capacious harbour, which was formerly defended by a strong fort and batteries. The town itself is surrounded by a very thick wall and towers built by the Arabs. The fort however was blown up by the French on their evacuation of the Peninsula. During the sixteenth and seventeenth centuries the port of Rosas carried on a brisk trade with the Spanish colonies. It is now reduced to a mere fishing-town, the population of which, according to Miñano (vol. vii., p. 566), did not exceed 2200 inhabitants in 1830.

RO'SCIUS, QUINTUS, a celebrated Roman actor, was born near Lanuvium (Cic., *De Div.*, i. 36), but at what period is uncertain. He is frequently mentioned in the writings of Cicero, who was his friend and warm admirer. His talents also obtained for him the friendship of Sulla, who, during his dictatorship, presented him with a gold ring, the mark of equestrian rank (Macrob., *Sat.*, ii. 10), which honour was the more remarkable, as many passages in the Roman writers prove that the histriones were generally held in great contempt. So perfect however was Roscius in his art, that his name became almost synonymous with excellence in any other branch, and thus when an orator produced a great impression on his audience, it was customary to say 'a Roscius is on the stage.' (Cic., *De Orat.*, i. 28; *Brut.*, 84.) Actors frequently received instruction from Roscius, who used to say however that he had never had any pupil with whom he was satisfied. (*De Orat.*, i. 28.) Macrobius relates (*l. c.*) that Cicero and Roscius used to try which of the two could more frequently express the same thought, the one by his eloquence, the other by his gestures; and that Roscius derived from this exercise such a high opinion of his own art, that he wrote a work, in which he compared eloquence with the art of acting. Macrobius also states that Roscius received about a 1000 denarii a day for his acting (upwards of 35*l.*). He died about B.C. 61; since Cicero, in his oration for Archias, which was delivered in that year, speaks of his death as quite recent (c. 8). There is an extant oration of Cicero, though considerably mutilated, in defence of Roscius. The subject of the oration is a claim of 50,000 sesterces against Roscius, by C. Fannius Chaerea (*Ueber die Rede des Cicero für Q. Roscius*, Zeitschrift, i., p. 248).

ROSCOE, WILLIAM, born in 1753, near Liverpool, received a common school education till he was twelve years of age, after which he continued to improve himself by reading. When in his sixteenth year he was apprenticed to an attorney in Liverpool, and in 1774 he was admitted an attorney of the Court of King's Bench, and began to practice as such. In the meantime he wrote some poems, among others one on the origin of the art of engraving, which made him known to Sir Joshua Reynolds, Fuseli, and other distinguished artists. In 1784 he was elected honorary member of the Manchester Literary and Philosophical Society. He also turned his attention to the subject of the slave-trade, and wrote several pamphlets recommending its suppression. When the French revolution first began, Roscoe was one of its warmest partisans in this country. He wrote 'Strictures' on Burke's 'Two Letters addressed to a Member of the present Parliament,' reflecting in severe terms upon what Roscoe considered as an apostacy in Burke's political conduct. In 1796 Roscoe published the 'Life of Lorenzo de' Medici, called the Magnificent,' a work which established his literary reputation. The subject was happily chosen, and the author treated it well. The work went through several editions, and was translated into Italian, German, and French. It was generally well received on the Continent, but its spirit was criticised by two classes of writers: one of them, of which Sismondi may be considered as the representative, see nothing but perfection in a republican government, and cannot forgive Lorenzo for having controlled and curbed the Florentine democracy. Sismondi charged Roscoe with having deceived himself and others with regard to the character of his hero, who in Sismondi's eye was an insidious and crafty tyrant. It is curious to see Roscoe, who at one time was the advocate of the French revolution, accused of being the panegyrist of the tyranny of the Medici. The grounds of this controversy are adverted to in FLORENCE, HISTORY OF, and MEDICI, HOUSE OF. Another class of critics was angry with Roscoe for having exposed the part which Pope Sixtus IV. took in the conspiracy of the Pazzi, which led to the murder of Giuliano, Lorenzo's brother, and also for having spoken unfavourably of Cardinal Barbo, afterwards Paul II. On the subject of the Pazzi, Sismondi joined the papal advocates in representing that conspiracy as a laudable deed, justifiable under the circumstances in which it took place. After many years Roscoe replied to his various critics in pointed though temperate language in his 'Illustrations, Historical and Critical, of the Life of Lorenzo de' Medici,' 4to., London, 1822. He inserted in the appendix, among other documents, an important letter written to Sixtus IV. by the signoria, or executive, of Florence after the failure of the Pazzi conspiracy, which letter was discovered in the archives of Florence by the Rev. F. H. Egerton, and printed at Paris in 1814.

The second historical work of Roscoe is his 'Life and Pontificate of Leo X.' In this also the author has been charged with undue partiality for his subject. He has reflected with much severity upon the great reformers of the sixteenth century, because, while they struggled against the overgrown absolutism of papal Rome, they could not divest themselves at once of the habit of intolerance which they had derived from early education. Count Bossi translated the 'Life of Leo' into Italian, adding notes in which he rebutted several of the charges brought against Roscoe's former work concerning Lorenzo: 'Vita e Pontificato di Leone X., di Guglielmo Roscoe, tradotta e corredata di annotazioni ed altri documenti inediti, dal Conte Luigi Bossi, Milanese,' Milan, 1817.

Considered as works of erudition and of general interest, the lives of Lorenzo and Leo by Roscoe stand deservedly high. They introduce the reader to a splendid period of modern history, among a chosen society of scholars, poets, statesmen, and artists, who gathered round the hospitable board of Lorenzo, and afterwards in the more pompous court of his son Leo. Numerous anecdotes and other particulars concerning those individuals make the reader familiar with their persons; and poetical extracts and valuable historical documents add to the value of the work. The style is remarkably pleasing and fluent. These merits of Roscoe's biographies have been universally acknowledged, even by those who have censured the general spirit of his works.

Roscoe contributed greatly to encourage among his countrymen a taste for Italian literature and the fine arts. In his own town of Liverpool, the Royal Institution owes its formation to Roscoe's exertions.

Roscoe was returned to parliament for Liverpool in the Whig interest. In the latter part of his life he became partner in a banking-house, in which however he was not successful. He died at Liverpool, in June, 1831. A biographical notice of him is appended to a new edition of his Life of Lorenzo, by his son.

ROSCOEA, a handsome genus of the highly ornamental family of Scitamineæ or Zingiberaceæ, which was named by Sir J. E. Smith, in honour of the historian of the Medici, who elucidated the plants and remodelled the genera of the Scitamineæ in his beautiful work on that family. The species have been figured by Smith, Wallich, and Royle.

The genus consists of only a few species, which are confined to the Himalaya Mountains, and is characterised by having spathaceous flowers, a single-leafed tubular calyx, corol ringent, limb double, the outer tripartite, with the upper segment erect and arched. Inner limb two-lipped, ovary inferior, style enclosed in the furrow of the anther, which is two-lobed, incurved, surrounding the style with an appendage split at the base.

The species of Roscoea, belonging to so tropical a family as the Scitamineæ, are generally accounted showy stove plants; but they are found only on the slopes of the Himalayas during the rainy season, when there is moisture with uniformity of temperature, and a much less degree of heat than is usually thought necessary is found to be sufficient for the growth of tropic-like plants, and therefore less would suffice for the cultivation of these plants than is generally supposed; indeed Roscoea purpurea has been flowered in a drawing-room in London, under a glass case, and without any artificial heat. Dr. Graham mentions its springing up in the open air every year in the Edinburgh Botanic Garden. the genus Roscoea is that, of all the Scitamineæ, which is found at the greatest elevations. R. alpina is found at as great an elevation as 9000 feet above the level of the sea, and on places whence the snow had just melted, like the snowdrop in early spring in European countries. (Royle's *Himal. Bot.*, p. 357.)

ROSCOMMON, an inland county in the province of Connaught in Ireland, bounded on the north and north-east by the county of Leitrim, on the east by that of Longford, and on the south-east by those of Westmeath and King's, from all which it is separated by the river Shannon, except just on the north side; on the south-west it is bounded by the county of Galway, on the west by that of Mayo, and on the north-west by that of Sligo. The river Suck, a tributary of the Shannon, separates it along the greater part of the border from the county of Galway; and the Curlew mountains for a short distance from that Sligo. The form of the county is irregular; the greatest length is nearly from north to south, from the border of the county of Leitrim west of Lough Allen to the junction of the Suck with the Shannon, 60 miles; the greatest breadth, at right angles to the length, is from the junction of the three counties of Galway, Mayo, and Roscommon to the bank of Lough Forbes near Tarmonbarry, 40 miles. The area is estimated by MacCulloch (*Statistical Account of the British Empire*) at 952 square miles, or 609,405 English acres, of which 453,555 are in cultivation, 131,063 unimproved mountain or bog, and 24,787 lakes. In the return of the population for 1831, the area is stated to be 557,10 acres. We believe MacCulloch's statement, which is taken from a table furnished by Mr. Griffith, the engineer, to the Lords' Committee on Tithe, to be the most exact. The population in 1831 was 249,613, giving 262 inhabitants to a square mile. In area it is rather below the average of the Irish counties, but in amount and density of population rather above the average. Roscommon, the capital, is [illegible]0 English miles in a direct line west by north of Dublin, or 9[illegible] English miles by the road through Mullingar, Longford, and Lanesborough, or by Mullingar, Ballymahon, and Lanesborough.

Surface, Geology, Hydrography, Communications.—The surface of the county is partly undulating, but along the banks of the Shannon and the Suck, and in other parts, it is very flat. There are some mountains. The principal groups are the Braulieve, or Braughlieve, and Slievh Curkagh mountains (estimated at 1000 or 1200 feet high), which enter from the counties of Leitrim and Sligo on the north-west, and extend a little way into the county west of Lough Allen; the Curlew mountains, on the borders of Sligo near Boyle; the Slievh Bawn mountains, 839 feet in the northern part, and 857 feet high in the southern, parallel to the Shannon, and not far distant from it, on the east side of the county; the hills between the Shannon and the Suck in the south; and Slievh Aelwyn, between Castlerea and Ballinlough in the west. The Braughlieve and Slievh Curkagh have steep rugged acclivities and broad perpendicular faces of rock near their summits. The eastern side of the Slievh Bawn mountains slopes gradually down to the bogs in the valley of the Shannon at their base; the western side is more broken; the district at the foot is varied with wood.

The level parts of the county are for the most part occupied by the formations belonging to the great carboniferous limestone district of central Ireland. The impure argillaceous limestone, or 'calp,' the black shale, and the sandstone, which form one of the subdivisions of the limestone group, and the lower limestone, which constitutes another subdivision, subjacent to the calp, are found in this county. The hills west of Castlerea are composed of the yellow sandtone which is the lowest member of the limestone group. The Braughlieve and Slievh Curkagh mountains are composed of shales and sandstones, with three beds of coal esting on beds of the millstone-grit series, from which good ronstone is obtained. The coal of this district is not extenively diffused; it forms two fields partly or wholly in this ounty, separated from each other by the river Arigna, which lows between Braughlieve and Slievh Curkagh. There are ome other coal-fields in other adjacent counties round ough Allen. The coal answers well for smelting iron, and used in the Arigna iron-works (the only iron-works in d) in this county. Cast-iron of the best quality is uced at these works at a moderate expense. The comny by which they are worked are in possession of the st extensive and valuable coal-fields of the neighbourood.

The Curlew mountains and the Slievh Bawn mountains onsist of rocks of the old red-sandstone formation. (Grifths, 'On the Geological Structure of Ireland,' in *Appendix Second Report of Irish Railway Commissioners; Pariamentary Papers* for 1837-8, vol. xxxv.) Good limestone quarried for building. Potters'-clay and pipe-clay are ound in various parts of the county.

The county belongs to the basin of the Shannon, except a ery small portion at the western extremity, which is drained y the Moy, which flows into Killala Bay. Lough Allen, which the Shannon enters about five miles from its source, nd through which it flows, is on the north-eastern boundary f the county. From the southern extremity of this lough he Shannon flows along the eastern boundary of the county Carrick-on-Shannon, where it receives a stream from Lough Gara and Lough Key. From Carrick the Shannon ursues its course along the border, passing through Lough Corry, Lough Boderig, or Bodarg, Lough Boffin, and Lough Forbes to Lanesborough, below which it enters Lough Ree. It quits the southern extremity of Lough Ree just above Athlone, and runs southward to the junction of the Suck, where it quits the county, after a course along its eastern side, including the loughs through which it passes, of about 75 miles. The fall in this distance is very trifling. Lough Allen is only 160 feet above the level of the sea, and the fall between Lough Allen and the lower end of Lough Derg, which is above 40 miles below the junction of the Suck, is not more than about 62 feet, or about six inches to a mile. The Suck, the only important tributary of the Shannon, rises just within the county of Mayo, but its course is almost rely within or upon the boundary of Roscommon; its length may be estimated at more than 60 miles.

Both the Shannon and the Suck are navigable. The navigation of the Shannon commences in Lough Allen, from whence to Battle Bridge, about seven miles and a half below the Lough, a canal is cut for the purpose of avoiding the difficulties of the natural channel. Other short canals are cut to avoid rapids or other difficulties in the lower part of the course. Agricultural produce, turf, coal, timber, bricks, flags, stone, slates, sand, and manure are the chief articles conveyed by the river. The navigation through Lough Ree is difficult, owing to its shoals and sunk rocks, notwithstanding which a great number of pleasure-boats are kept on it. The Royal Canal opens into the Shannon opposite Tarmonbarry in this county; the Grand Canal, just below the junction of the Suck. The traffic on the canals consists chiefly of corn and butter sent to Dublin, and English manufactures and general goods sent in return. The navigation of the Suck commences at Ballinasloe (county of Galway) for light flat-bottomed boats; small row-boats ascend higher. But a canal is cut parallel to it on the Galway side of the river, from Ballinasloe to the Shannon. Both the Suck and the Shannon abound with fish, especially eels, of which great quantities are taken in weirs and sent to Dublin. Those of the Suck are peculiarly fine.

The principal roads are the mail roads from Dublin to Sligo and to Galway. The Sligo road just crosses a corner of the county between Drumsna and Jamestown, re-enters at Carrick, and passes north-west through Boyle. The Galway road enters the county at Athlone, and crosses it in a south-west direction to Ballinasloe in Galway. The roads are excellent. Another road to Sligo, which branches off from the mail road at Longford in Longford county, passes through Tarmonbarry, Strokestown, and Elphin, and rejoins the mail road at Boyle. The road from Dublin to Roscommon (whether by Ballymahon or Longford) enters the county at Lanesborough, and runs south-west nearly eleven miles to Roscommon. Generally speaking the roads of the hilly district in the northern part of the county are inferior to those in the more level districts of the centre and south.

The principal lakes are Lough Allen (8 miles long from north to south, and 3 miles broad); Lough Bodarg, or Boderig, and Lough Boffin (forming one sheet of water of intricate form, 5 miles from the northern extremity to the south-eastern, and 7 miles to the south-western); Lough Forbes and Lough Ree (17 miles long from north to south, and 7 miles broad), all on the Shannon; Lough Gara (5 miles long from north to south, and 5 miles broad); Lough Key (otherwise Rockingham Lough); and Lough Oakport, all communicating with the Shannon by a stream called the Boyle Water; Lough Skean and Lough Meelagh, also communicating with the Shannon, and situate, as well as those just mentioned, in the northern part of the county; Lough Glin or Glynn, Lough Cloonagh, and Lough Aeluyn, all small, in the western part; Lough Funcheon and Lough Ballyneeny, in the southern part; and several others in the central and eastern part. The line of lakes on the Boyle Water, Lough Glynn, and Lough Meelagh are surrounded by picturesque and beatiful scenery. Besides these there are a number of 'turloughs,' or temporary lakes, formed in the hollows of the limestone tracts. They usually disappear in summer, but not always; and when dry early in the season, such as have grassy bottoms produce abundant crops. The water is drained off by fissures and passages in the limestone rock, which get choked by the vegetable matter washed into them by the first winter floods, and are cleared next summer by the decay of this obstruction. The size of these 'turloughs' varies with the season: some of them are of considerable extent.

The soil in the limestone district is commonly fertile; there is however a large extent of bog or other waste. The amount of pasture land is considerable: the natural pastures, which are esteemed to be some of the best ground in the county, are in the limestone districts, especially between Tulsk, Castlerea, and Boyle. Rich deep loams are met with; and there are, especially along the limestone ridges between the Shannon and the Suck, extensive tracts of light shallow soil, so shallow indeed that in some parts the plough cannot be used. These tracts are commonly used for sheep-feeding. The surface of the mountains is commonly wet and boggy, but there are intervening spots of dry ground covered with heath. Some of the soil in the sandstone districts, as in the Curlew Mountains, near Boyle, is very poor, but is capable of great improvement from the admixture of lime, or rather of a compost of lime and bog earth, which is to be had readily. Much may be done in this way, as well as by draining cold wet lands, whenever capital comes to be employed more extensively than at present in agricultural improvement.

The extent of the unimproved mountains and bogs has been estimated at above 130,000 English acres, the bogs being dispersed over the face of the country in patches of various size and in almost every variety of situation: they are found on the tops of the highest mountains, on the banks of the loughs and rivers, and in the bottoms of the valleys. Several of those on the uplands are comparatively dry, and afford in their natural state coarse pasturage for young and hardy cattle. Something has been done by spirited individuals towards reclaiming some portions of this large amount of waste land, but nothing has been done upon a large scale or upon any plan of co-operation.

Many of the estates in the county are large, some belonging to resident landlords, others to absentees. Rents vary; on farms of several hundred acres, 20*s*. and 25*s*. per acre are usual, but, sometimes 30*s*. and 35*s*. are given, and, in the immediate neighbourhood of towns, as much as 60*s*. and 80*s*. Tillage has been much extended of late years, and the quantity of food raised is probably greater than at any former period; but, excepting on the land held by a few wealthy individuals, the state of agriculture is very wretched, especially on the smaller farms. 'To say nothing of the deficiency of produce attributable to bad ploughing, unskilful sowing, want of manures, and an utter inattention to the alternation of green crops with those of corn, potatoes alone excepted, the loss upon what the land actually does yield is considerable, from bad and careless stacking, and the general want of barns. The stacks are commonly made very small, resting upon the earth; for in a country so bare of timber and hedgerows, boughs and bushes are scarce articles. If wet weather comes on and continues long, much of what lies below, next to the earth, perishes by attracting moisture: from the want of a broad and firm basis, the frail structure is liable likewise to be swayed by the wind; and the tops and sides losing their original form, and being no longer capable of throwing off the rain, still more damage ensues. To such losses are likewise to be added the depredations from vermin, rats, mice, and small birds, whilst the corn remains out of doors.

'As for barns, in the English and Continental acceptation of the term, they are literally unknown. The floor of some outhouse, or perhaps even that of the family room, may be used for threshing; but a vast proportion of the grain is beaten out in the open air, very commonly near the road side, where there happens to be a dry spot. These observations, it must be understood, apply to the small holdings; but upon such is raised a considerable quantity of the corn which is thrown into the market from the county of Roscommon.' (Weld's *Statistical Survey of the County of Roscommon*, 8vo., Dublin, 1832.)

The common ploughs of the small farms are very wretched: whether the instrument works well or ill is a matter of chance, and the plough is commonly followed by a man with a spade, or rather a 'loy,' to turn back the earth, which would else, after the plough had passed, revert to its former bed. However, on the lands of the principal gentry examples may be found of excellent tillage, with Scotch ploughs of the most approved construction, drawn by a pair of horses and driven by the ploughman. The 'loy' mentioned above is a sort of curved spade or shovel, of clumsy form, and with a handle of unusual length, far inferior to the spade in general utility, but not ill adapted for use in turning up a light shallow soil in rocky districts, where the plough cannot be used. In certain districts of the county where spade labour is common, the labourers unite in companies, and work for each other in rotation. This is the case especially in busy times, such as potato planting or digging, and lightens their toil by the cheerfulness which prevails.

'Wheat is commonly sown immediately after the crop of potatoes has been dug out. After the wheat, two or three crops of oats are taken, all for the one manuring for the potatoes; and then the ground is sometimes laid down with grass seeds, in a state unquestionably too poor for the purpose; sometimes "let out," in the phrase of the country, that is, left to nature to be clothed with grass of spontaneous growth, a process which is sure in time to be accomplished, though always more tardily than if the seeds were sown.' (Weld, *Statistical Survey of the County of Roscommon.*) This practice of 'letting out' is very injurious; and it is supposed that by the introduction of stall-feeding, and the cultivation of the artificial grasses and other green crops, the productiveness of the soil might be increased twofold.

The extensive grazing-farms of the county contrast favourably with the tillage land; yet, even in these, much improvement is needed. Thistles are allowed not only to remain, but to spread; so that it is no unfrequent circumstance for sheep to be pricked in the eye and blinded by them. The highest quality of pasture land consists commonly of natural grass. The favourite breed of oxen seems to be the long-horned Leicester. The principal graziers supply themselves at fairs for summer feeding: they raise only a few head themselves, and those of some superior breed. It is common also to have brood-mares on the large grazing-farms, and several fine horses of good blood are bred. There are no dairies on a large scale, but butter is made more or less in every part of the county. The sheep are considered to be far better than those reared in the adjacent counties, a result attributable partly to the superior skill and intelligence of the sheep-farmers, and partly to the dry and wholesome nature of their sheep-walks. The favourite breed is a cross between the old Connaught sheep and the Leicester, 'which produces an animal little inferior in size to the former, with a greater disposition to fatten in a short space, and with less waste or offal on the carcass.' (Weld, *Statistical Survey of the County of Roscommon.*)

The 'con-acre' system is general, but in some parts of the county is not carried to any great extent. The consolidation of the small farms into large has not been much practised; in some instances where it has taken place the tenants who were dispossessed were assisted to emigrate. Emigration has taken place in most parts of the county, but not to any great extent: the emigrants have been from various classes. They have gone chiefly to Canada or to the United States, but a few have gone to Australia. (*Appendix to First Report of Commissioners for inquiring into the State of the Irish Poor.*)

The condition of the peasantry, or 'cottiers,' is very miserable. In some places they occupy cabins without paying any rent; but more commonly they pay for a cabin, without land, a yearly rent varying with the locality, frequently rising to 1*l*., in some cases to 1*l*. 10*s*., and in the town of Boyle, as high as 2*l*. 10*s*.; with land, the yearly rent rises occasionally to 3*l*. and 3*l*. 10*s*. The rent is paid sometimes in money, sometimes in labour, in which cases the rate of wages is about 6*d*. a-day, and occasionally 8*d*. or 9*d*. The cabins are wretched hovels, built of mud or sods; or, where stone is abundant, with stone walls, either dry or with mortar, and thatched with straw or potato-stalks. The furniture is of the most miserable description, made up of a table, three or four stools, a box, and a pot or two. Bedsteads are comparatively rare; and the bedding consists of straw, having a blanket, perhaps only a sack, with the addition of the sleeper's day-clothes for a covering. In some parts of the county it is common for two families, or even more, to reside in one of these wretched habitations. The condition of the peasantry has very generally deteriorated since 1815, partly in consequence of the linen manufacture having declined. Disturbances have been frequent in many places, while in others the people have been very peaceable. There are a few charitable loan societies, some of them established from the funds raised in England for the relief of the Irish in 1823. Illicit distillation is prevalent, especially when corn is at a low price. Employment is scarce, and only a small portion of the peasantry have constant work. Wages are commonly 8*d*. or sometimes 10*d*. a-day without diet; or 6*d*. with diet, in summer; and 6*d*. a-day without diet in winter. In busy times, and in the neighbourhood of the towns, higher wages are paid. The average yearly gains of a labourer are variously estimated, but commonly from 7*l*. or 8*l*. to 10*l*. a year. Women and children get little employment, except at busy seasons, such as potato setting and digging, and in harvest, when they earn 4*d*. or 5*d*., or even 6*d*. a-day without diet. Herdsmen are usually better off. On a farm of fifty acres, they get a cabin, an acre of potato or cabbage garden, and grass for a cow; on a farm of a hundred acres, two acres of garden, and the grass of two cows, with the opportunity besides of keeping a pig or a few geese. The diet of the peasantry consists of potatoes, with the addition, in some cases, of milk, or buttermilk, red herrings, and oatmeal for gruel. Their clothing is commonly of the most wretched character.

Divisions, Towns, &c.—The county is divided into six baronies, or half-baronies, as follows:—

	Situation.	Pop. 1831.
Athlone	S. .	56,865
Ballintobber* . . .	W. .	70,597
Ballymoe (half barony) .	S W. .	7,353
Boyle	N. & N.W.	66,103
Moycarne or Moycarnon (half-barony)	S. .	7,243
Roscommon . . .	Central .	41,450

There are, in the county, the assize and market town of Roscommon; the market and post towns of Boyle, Castlerea, Elphin, Frenchpark, and Strokestown; and the post towns of Athleague, Keadue, and Mount-Talbot. Portions of the borough of Athlone [ATHLONE], and of the towns of Ballinasloe [BALLINASLOE], Carrick-on-Shannon, and Jamestown [LEITRIM, COUNTY OF], and Lanesborough [LONGFORD, COUNTY OF], are also within the border. The principal villages are Lough-Glynn, Ruskey, Knockcroghery, Tarmonbarry, and Castle Plunket.

Roscommon is in one of the detached portions of the barony of Ballintobber. It appears to have derived its origin and its name (Ros-Coman, 'the pleasant place of Coman') from an abbey founded about A.D. 550, by St. Coman or Comanus. Another abbey of greater magnificence was founded here for the order of Preaching Friars, about A.D. 1257, by O'Conor, king or prince of Connaught; and a few years after, a strong castle was built by Sir Robert de Ufford, one of the early English adventurers. Of these last wo edifices there are considerable remains; the castle is on e north side of the town, and the abbey on the south side. oth are on level ground, while the town occupies the rn and southern slopes of an intervening eminence. castle is an oblong quadrangle, with a tower at each gle, and two additional towers to defend the gateway, ch is on the eastern side. The town consists of three four streets irregularly laid out, having in the centre open space opposite the old gaol, a building situated the summit of the eminence on which the town but now disused as a prison from want of suf- space. Near this is the old court-house, now con- rted into a Catholic chapel. A new court-house, a sub- tial and commodious building, but deficient in archi- ural correctness and effect, and a new gaol, have been ilt, and near them are some good new houses; but with the ception of these, the town presents an appearance of retchedness and decay; four-fifths of the houses are mere bins. There is a neat church with a square tower. The wn is ill supplied with water. There is a county infirmary ar the new court-house, a plain brick building. The ins of the Abbey church are of various dates; they con- in a tomb, said to be that of O'Conor, founder of the ey, with a mutilated effigy recumbent on it, and effigies Irish gallow-glasses (antient light infantry) sculptured relief on the perpendicular sides of the tomb. The in- of the church is still used as a burial-ground.

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* The principal part of the barony of Ballintobber is on the west side of the county; but there are two other large portions quite detached from it, on the banks of the Shannon and Lough Ree.

parish extends into the barony of Athlone; the en- e population in 1831 was 8374, of whom 3306 were in the wn. The shops are numerous, but business does not ar to thrive as in some other towns in the county. e pottery is manufactured near the town. There is weekly market on Saturdays, well attended, at which corn, e materials of clothing, and articles of clothing made p, are sold to a considerable extent. There is no direct ommunication with Dublin; but there are cars to Athlone nd to Killashee on the Royal Canal. Mendicity and pro- ution prevail to a frightful extent. There is a barrack from the town.

assizes for the county are held here; and also the piphany and Midsummer quarter-sessions for the division, h comprises the baronies of Athlone, Ballymoe, Moy- , and part of Ballintobber, and petty sessions for the ict. The town was formerly a parliamentary borough, was disfranchised at the Union, since which time the cor- poration has become extinct. There were in 1835 six schools onnected with the Kildare-place Society, the London Hibernian Society, the London Ladies' Hibernian Society, or supported by endowment or contribution; a classical school, nd eleven hedge-schools: in all, eighteen schools.

Boyle is about 108 miles from Dublin, on the mail-road to Sligo, and on the stream (the Boyle Water) which flows from Lough Gara into Lough Key. The town appears to have risen under the protection of a Bernardine abbey, which was transferred to Boyle, A.D. 1161, and attained great wealth. The ruins exist on the left or north bank of the Boyle Water, about a quarter of a mile below the town bridge; they are tolerably extensive, and include the remains of the church and of some of the monastic buildings, ow enclosed in a private garden. Some of the arches were alled up after the suppression, when the abbey was for a occupied as a military post. The older part of the wn stands on the northern side of the river; the more mproved part on the southern. The newer houses are in this ; they are built of limestone or sandstone. Of about hundred houses, three-fifths are miserable thatched and half the remainder are little better. The town nveniently laid out. The bridge over the river is a structure, 100 feet long and 42 feet wide, of hes, and lately built in place of an older bridge, h had five low narrow arches. A new bridge of one rch has been thrown over the river a little below the town bridge, and just above the ruins of the abbey; and a third bridge lower down. The church is capacious, but the architecture is not in good taste. There are two Roman Catholic chapels, one or two dissenting places of worship, a new sessions-house, a bridewell, and a barrack; the last was formerly a nobleman's mansion. The old sessions-house has been pulled down, and a building for religious and charitable purposes erected on its site.

The population of the town, in 1831, was 3433; of the whole parish, 12,597. The town is fairly provided with shops, and is the mart of the surrounding district. Corn, and butter, which is sold in firkins for exportation, are the staple articles of trade. The butter-market is on Monday; but the principal market, at which a considerable quantity of linen yarn is sold, is on Saturday. Heavy goods are chiefly brought from Sligo, lighter ones from Dublin. There are six fairs in the year.

Boyle was formerly a parliamentary borough, but the privilege of returning members was lost by the Union; and the corporation has been dissolved by the late Irish Municipal Reform Act. There were in the parish, in 1835, seventeen day-schools, including two private boarding-schools, two national schools, one school supported by the Baptist Society, four schools partly supported by subscription, four private day-schools, and four hedge-schools. There were beside four Sunday-schools. A weekly newspaper is published at Boyle.

The quarter-sessions are held here twice in the year, for the division which comprises the baronies of Boyle and Roscommon and part of the barony of Ballintobber; petty-sessions are also held. There is a barrack for the county constabulary, of whom a body are stationed here. There are a charitable loan society, and two dispensaries, one maintained by Lord Lorton, whose beautiful mansion and demesne of Rockingham are on the banks of Lough Key near the town.

Castlerea is in Kilkeevan parish, in the barony of Ballintobber, 17 miles north-west of Roscommon, on the river Suck, which runs through the town, and divides it into two parts; a small stream, a feeder of the Suck, also runs through the town, and joins the river just below. The town consists principally of one long street, the continuity of which is interrupted by two bridges over the Suck and its feeder. Many of the houses are new, nearly one-half of the southern side of the street has been rebuilt, and new cottages for the peasantry are springing up on every part of the estate of Lord Mountsandford, whose demesne and residence are close to the town. The population of the town, in 1831, was 1172; that of the whole parish, 10,867. Of about 170 houses, nearly 70 were mere cabins, and about 25 were thatched houses of two stories; but the cabins are better than in most other towns in the county, and some of them are remarkably neat. There are several neat cottages with gardens in the neighbourhood.

The market is on Wednesday for corn, and on Saturday for provisions. There are a malthouse, a distillery, and a tan-yard, and a number of small shops. There is a market-place, with convenient shambles. There are four fairs in the year. The Easter quarter-sessions for the Boyle division of the county are held here. The sessions-house stands near the market-place; and there is a bridewell. Petty sessions are also held. The parish church of Kilkeevan is close to the town, and there is a Catholic chapel.

The parish had, in 1835, twenty-three day schools, including two national schools, one school chiefly supported from Erasmus Smith's fund, nine supported by Lord Mountsandford, one supported by the Catholic clergy of the parish, a classical school, and nine hedge-schools. There are a loan fund and a dispensary.

Elphin is in the barony of Roscommon, 11 miles south by east of Boyle. The town extends along the summit of a ridge, and runs nearly east and west: more than two-thirds of the houses are mere cabins, many of them of the most wretched character; there are scarcely any slated houses. The cathedral stands at the eastern end of the town, and the Catholic chapel at the western. The cathedral, a modern building, of barn-like appearance, about 80 feet long and 28 broad, with a slated roof, is little in harmony with the tall dilapidated square tower with which it is united. It is used as the parish church, and is neat in its internal appearance. The bishop's palace is a spacious and comfortable country-house, with a lawn in front. The Catholic chapel is commodious, but not elegant.

The population of the town, in 1831, was 1507; of the whole parish, 6643. The shops are small and ill-supplied. A market has been established within the last few years by the bishop. There is a dispensary. There were, in 1835, three day-schools, supported, one by the clergy and the Society for Discouraging Vice, and two by the London Ladies' Hibernian Society, and nine hedge-schools. The diocesan school, founded by Bishop Hodson, A.D. 1685, is not noticed in the Parliamentary Returns. There are two yearly fairs at Elphin.

French-park is in the barony of Boyle, 9 miles south south-west of Boyle. It is a small place, containing about a hundred houses, most of them mere cabins, at the junction of four roads. There are a Catholic chapel, a school-house, and a sessions-house; and a market-house has been erected within the last few years. The mansion and demesne of French-park, the seat of the French family, are close to the town; and about half a mile distant, on the verge of a bog, are the ruins of Clonshanvill Abbey. The ruins consist of the walls of the church, with its steeple, two detached chapels in the burial-ground, and the remains of a square building belonging apparently to the habitable part of the abbey. The ruins, from their situation in a flat open country, form a striking object at a distance, but are neither very picturesque nor of much antiquarian interest when viewed nearer. In the burial-ground, which is still used, is a lofty cross. The population of the town, in 1831, was 447; that of the parish of Tybohan or Taughboyne, in which it stands, was 16,460. Butter, yarn, and pigs are sold in the market, which is held on Thursday. There are three yearly fairs. Good sandstone is quarried in the immediate neighbourhood, and limestone in the town itself. Petty sessions are held here. French-park has a dispensary.

Strokestown is in the barony of Roscommon, between Elphin and Lanesborough. It contained, in 1831, about two hundred and sixty houses and 1547 inhabitants. The town consists of two streets crossing at right angles; the one which runs east and west is nearly 150 feet wide, and has Lord Hartland's demesne and mansion at one end, and a new church at the other. Three-fifths of the houses are mere cabins, and more than another fifth are thatched cottages, little better than cabins. The rest are built of limestone or sandstone, both of which are procured near the town, and are roofed with Welsh slates, imported into Sligo, and brought from thence by land carriage. Trade is prosperous, and the market is well attended; a considerable quantity of wheat, for the growth of which the soil round the town is particularly favourable, is sold; and the country-people bring in linen, linen yarn, tow, woollen stockings, flannels, and a peculiar kind of woollen stuff which is dyed and dressed in the town. The market is also well supplied with lake and river fish, and some sea-fish, and goods of all kinds are sold in stalls. There are four yearly fairs. There are a sessions-house and bridewell, and the quarter-sessions for the Boyle division of the county are held here once in the year. There is also a dispensary. The old mansion-house of Lord Hartland has been modernised: in the grounds, at a short distance from the house, are the roofless walls of an old church, used as the family burial-place. Races are held at Ballynafad, three or four miles south of the town.

Athleague is a small place, containing, in 1831, eighty-seven houses and 488 inhabitants: there is a long bridge, or rather series of bridges connected by a long causeway, carried obliquely across the river Suck, which here flows in a divided channel. Athleague is a dull place, with little trade; there is a flour-mill. Four fairs are held in the year. The church is an old building in bad repair; there is a Catholic chapel in the town. Keadue is in Boyle barony, ten or eleven miles north-north-west of Carrick-on-Shannon; it consisted, in 1831, of about forty houses, chiefly cabins. A market-house was then building; and the place was increasing in prosperity from the neighbourhood of the Arigna iron-works. There are ten yearly fairs. Keadue has a dispensary. Mount-Talbot is in Athlone barony, on the banks of the Suck, and takes its name from the demesne of the Talbot family, which is close to the village. It is a small place, pleasantly situated. Mount-Talbot has four fairs in the year. Petty sessions are held both here and at Keadue.

Lough-Glynn had, in 1831, about fifty houses, chiefly cabins, but superior to those commonly met with; there were a Catholic chapel and a dispensary near the village, and a parish church at some distance: the population was 254. Ruskey or Rooskey is in Ballintobber hundred, and on the Shannon, over which is a bridge of nine arches; the village extends across the river into Leitrim and Longford counties. The church of the parish of Tarmonbarry is in the village; also a Catholic chapel. Knockcroghery (pronounced Nocrohery) is in the barony of Athlone, about 5 miles south-east of Roscommon, not far from Lough Ree. It has a new church and new school-houses. A considerable manufactory of tobacco-pipes is carried on; and there are two yearly fairs, one of them a large one. Tarmonbarry is in Athlone barony, on the right bank of the Shannon, which is here divided into two arms, over each of which there is a bridge: these bridges are connected by a causeway over the intervening island. The Royal Canal terminates in the Shannon at Richmond harbour opposite Tarmonbarry: there are extensive basins, docks, and warehouses on the Longford side of the river. Castle-Plunket is a miserable place of about forty miserable cabins. Lough-Glynn and Tarmonbarry have each four fairs in the year; Castle-Plunket has three.

Divisions for Ecclesiastical and Legal Purposes.—The number of parishes in the county is differently stated; we believe the correct number to be fifty-six. These, with some of the adjacent parishes in the next counties, make thirty-one benefices; of which twenty-seven are in the diocese of Elphin, one in that of Clonfert, one in Ardagh, and two in Tuam. All these dioceses were in the ecclesiastical province of Tuam, except Ardagh, which was in the province of Armagh; but by the late alterations in the Irish church, all are now in the province of Armagh.

The county is included in the Connaught circuit: the assizes are held at Roscommon, where is the county gaol. The county is divided into two parts for the sessions business: the division of Athlone comprehends the baronies or half-baronies of Athlone, Ballymoe, Moycarne, and part of Ballintobber; the division of Boyle comprehends the baronies of Boyle, Roscommon, and the rest of Ballintobber the sessions for the first are held alternately at Athlone and Roscommon; those of the second, twice in the year at Boyle, once at Castlerea, and once at Strokestown. The county gaol is at Roscommon, and there are bridewells at Athlone, Boyle, Castlerea, and Strokestown. The discipline of the county-gaol is very defective; the great objects of prison discipline are altogether lost sight of; nor is the size of the gaol or the number of the cells sufficient. The bridewells of Athlone and Boyle are clean and well ordered. Those of Castlerea and Strokestown are for the temporary lodgment of prisoners. The constabulary force, on 1st January, 1838, amounted to 244, viz. 1 subinspector, 6 chief constables, 7 head-constables, 43 constables, and 187 subconstables.

There is a county infirmary at Roscommon, and d [illegible] ries at Athlone, Boyle, Castlerea, Elphin, French-park, Strokestown, Keadue, Lough-Glynn, Croghan, Tulsk, and Ballyleague. The county is included in the district of Connaught lunatic asylum, which is at Ballinasloe.

Two members are returned for the county, who are elected at Roscommon. Athlone, which is partly in this cou [illegible] s the only parliamentary borough. The number of vo [illegible] the register for the county in 1834-5 was 1864; for the borough of Athlone 274.

The amount of grand-jury presentments in the year 1837 was 27,051*l.* 18*s.* 3*d.*, viz.: for new roads, bridges, &c. 2502*l.* 3*s.* 6½*d.*; for repairing roads, bridges, &c., 7884*l.* 2*s.* 11½*d.*: for building or repairing gaols, bridewells, and houses correction, 41*l.* 10*s.*; for prison and bridewell exp [illegible] 1915*l.* 15*s.*; for the police and expenses of witnesses, [illegible] 0*s.* 10¾*d.*; for salaries of county officers, not included in the foregoing heads, 3376*l.* 18*s.*; for public charities, 1454*l.* 17*s.* 2*d.*; for the repayment of government advances, 5105*l.* 6*s.* 10½*d.*; and for miscellaneous expenses, 572*l.* 3*s.* 10*d.*

History, Antiquities, &c.—In the earliest historical period this county appears to have been partly or wholly in possession of the Auteri, a people mentioned by Ptolemy, and supposed by Sir James Ware (*Hist. of Ireland*, vol. ii., ch. vi.) to have inhabited some part of the counties of Galway and Roscommon. At a later period it was occupied by the septs or clans of O'Conor Ruadh (red), Rough, or Roe: and O'Conor Dhunne (brown) Dunn, or Don, whose territories comprehended respectively the baronies of Roscommon and Ballintobber; and by the sept of the Macdermots, whose territories now constitute the barony of Boyle; the parts bordering on Galway were occasionally encroached upon by the O'Dalys and the O'Kellys of Galway. The territories of the two tribes of the O'Conors were called Hy-Onach; those of the Macdermots were called Moylurg or Moylurg; and those of the O'Dalys and O'Kellys, Hy-Maine or Mainech. Part of the county was included, with a portion of Galway, in Clanckonow, the territory of the Bourks: the most northern part was included in Corcachlann, the territory of the O'Hanlys and O'Broenans: between the Suck and the Shannon was the district of Dealbhna Nuadhat; Hy-Briun Sinna was another district along the bank of the Shannon; and a district called Kierrigia-ai, afterwards Clan-Kethern, was included in the county, but what part is not specified. (Ware, *Hist. of Ireland*, chap. i., sec. 1.)

Of the earliest period there are few memorials, the raths ill-forts or earth-works) are the principal. Of these there e than four hundred and seventy. They are always natural eminences. They contained within their ram- the dwelling-places of the chieftain and his family, mmonly constructed of earth and hurdles, but having metimes wooden walls upon a foundation of earth. At ran, between Roscommon and Castlerea, is one of the und towers whose use and origin are so uncertain. It is ly about twelve feet high, and bears the appearance of ver having been finished, rather than of having been wn down. Its interior diameter is 11 feet 3 inches; the thickness of the walls 4 feet 6 inches. It is built limestone; the stones are well cut, fit closely, and are id in even courses.

Seven years after the English invasion of Ireland, the unty was attacked by Milo or Miles de Cogan, one of the ost active and warlike of the English adventurers. Ros- mmon formed at that time part of the kingdom of Con- ught, and was governed by Roderic O'Conor, recognised sovereign of Ireland. De Cogan advanced with 40 nights, 200 other horsemen, and 300 archers to the town Roscommon, where he was joined by Murrough, son of deric, at the head of a body of malcontents. The natives wever, by driving away their cattle and laying waste their untry, reduced De Cogan and his army to great danger om famine, and obliged them to retreat. In 1204 the unty was again ravaged by William Bourke (or de Burgo) tz-Aldelm, lord of Limerick and the neighbouring untry: in 1216, the castle of Athlone, on the frontier, was ected to secure a ford of the Shannon, and in 1268 that of oscommon was built to secure the quietness of the county, that time assumed to be subject to the English, and in- uded in a grant of Connaught, made by Henry III. to the y of De Burgo, or De Burgh, who held also the earl- of Ulster. The native princes of the country, though cognising the supremacy of the English crown, were not isposed to submit to such wholesale spoliation, and the stle of Roscommon was twice taken by them, A.D. 1272 and 276. This part of Ireland appears to have been long in a of anarchy, the Irish septs struggling for independence the De Burgos, their Anglo-Norman masters. In A.D. 315, Richard de Burgo, earl of Ulster, and Fedlim or helim O'Conor, Irish prince of Connaught, advanced in onjunction from Roscommon, to repel the invasion of the cotch under Edward Bruce; but O'Conor, seduced by he offers of Bruce, entered into a secret treaty with him; returned home to guard his own inheritance against his sman Roderic, who sought to usurp it. Fedlim, whose reaty with Bruce was not known, was supported by the nglish, and by their aid he defeated Roderic, who fell in he battle. He now avowed his alliance with the Scots, but entirely defeated by the English under William de brother of Earl Richard, and Sir John Bermingham, enry in Galway, A.D. 1316. The victory utterly broke he power of the O'Conors, who split into clans or septs, f which two have been noticed as occupying portions of oscommon. These two septs became rivals, and wasted r strength in mutual hostilities. Meanwhile, the inhe- of the De Burgos came by marriage to Lionel, duke rence, son of Edward III., whose descendants after- ards came to the throne in the person of Edward IV., ex- ept such of the territories of the family in Connaught as ere usurped by some of the younger branches.

Of this troubled period there are several memorials, in ruined castles and monastic buildings which exist. ommon Castle, and Roscommon, Boyle, and Clonshanvill , the last near French-park, have been noticed. Be- Roscommon and Castlerea are the ruins of Ballin- Castle, the antient stronghold of the O'Conor une or Don. The walls enclose a quadrangle 270 feet 237 feet, and are strengthened by polygonal towers resem- those of Caernarvon Castle. The walls and the towers olerably complete externally; but the towers are little than shells. There are the walls of the church and of of the dependent buildings of Tulsk Abbey standing. e was formerly a strong castle at Tulsk, and there was t Ballynafad near Strokestown, of which the ruins are le: it was the stronghold of O'Conor Ruadh. A very able ruined fort of unknown antiquity is to be seen ough Glynn. The keep of Athlone Castle, which is yet standing, is a decagon, and is in the Roscommon part of the town. There are several remains of small castles, especially of one on Castle Island in Lough Key, but none of them deserving particular description. There are considerable ruins of Coote Hall, a fortified mansion of the middle ages, between Lough Key and the Shannon.

In the reign of Elizabeth, Connaught was formed into counties, and the county of Roscommon divided into baronies. This measure is ascribed by some to the earl of Sussex lord-lieutenant (A.D. 1562-64); by others to his successor, Sir Henry Sidney, lord deputy (A.D. 1665-67); while Mr. Weld (*Statistical Survey of the County of Roscommon*) ascribes it to Sir John Perrot, lord deputy, whose administration was considerably later (A.D. 1584-88).

In the rebellion in Elizabeth's reign, the O'Conors remained faithful to the English. Boyle Abbey was besieged by the Ulster insurgents in the war of 1641. The county fell into their hands, and the O'Conor Dhunne now took part with them: some severe encounters took place, especially in 1642, when Callaugh O'Conor was defeated by the English. The insurgents long retained possession of the county, but on the termination of the war their chiefs were deprived of their estates, which were confiscated, and divided among English and Scotch adventurers. At the Restoration O'Conor Dhunne or Don obtained the greater part of his property again, and his descendants are among the few native Irish families who have retained their lands. In the war of the Revolution, the principal events connected with this county were the first ineffectual siege of Athlone by a body of William's army, under General Douglas (A.D. 1690), and the subsequent siege and capture of that city (A.D. 1691) by the main body of William's troops, then under General Ginkell. [ATHLONE.] This was followed by the decisive battle of Aghrim [AGHRIM], fought in the adjacent county of Galway. Roscommon gives the title of earl to the noble family of Dillon.

(Weld's *Statistical Survey of Roscommon;* Ware's, Cox's, Gordon's, and Moore's *Hist. of Ireland; Parliamentary Papers;* Lewis's *Topographical Dictionary of Ireland.*)

ROSCOMMON, WENTWORTH DILLON, EARL OF, was born in Ireland about 1633. He was the son of James Dillon, third earl of Roscommon, and Elizabeth Wentworth, sister to the earl of Strafford, who was godfather to his nephew, and gave him his own family name. Upon the breaking out of disturbances in Ireland, Strafford sent for him, and placed him at his own seat in Yorkshire, where he had him instructed in Latin, which Dillon is said to have learned so as to write it with purity and elegance, though he was never able to retain the rules of grammar. When the storm had overtaken Strafford, Dillon was sent to Caen, where he prosecuted his studies under Bochart. He afterwards travelled into Italy, where he examined with care the most valuable remains of classical antiquity, and he acquired uncommon skill in the knowledge of medals. He returned to England at the Restoration, and was made captain of the band of pensioners, a preferment which led him into the habit of gaming and the loss of much of his fortune. He was subsequently appointed master of the horse to the duchess of York, and he married the Lady Frances, daughter of the earl of Burlington, and widow of Colonel Courtney.

Wood says of Roscommon that he 'was educated from his youth in all kind of polite learning,' and that he 'was accounted most excellent in the art of poetry.' He was nominated at Oxford to be created LL.D., May 23rd, 1683, but did not appear at the time appointed. Whether he had previously been connected with the University is uncertain. He formed the intention of escaping apprehended evils at home by retiring to Rome, but he was delayed by the gout, which, through improper medical treatment, occasioned his death. At the moment in which he expired, he uttered, with an energy of voice that expressed the most fervent devotion, two lines of his own version of 'Dies Iræ:'

> 'My God, my Father, and my Friend,
> Do not forsake me in my end.'

He died in 1684, and was buried with great pomp in Westminster Abbey.

Roscommon wrote the following works: 1, 'An Essay on translated Verse,' London, 1680, 4to.; 2, 'Prologues and Epilogues to Plays,' &c., collected 1684, 8vo.; 3, Horace's 'Art of Poetry,' translated into English blank verse, 1680, 4to.; 4, 'Dr. Wm. Sherlock's case of Resistance of Supreme Powers,' translated into French, 8vo. A short time before his death, Roscommon, among other literary projects, formed the plan of a society for refining the English language and fixing its standard, and he is said to have been assisted in the design by John Dryden; but no particulars upon this subject are recorded.

(Wood's *Fasti Oxonienses;* Johnson's *Lives of the Poets;* Walpole's *Royal and Noble Authors*, Park's edition.)

ROSE. [ROSA.]

ROSE-COLOURED OUZEL. [STURNIDÆ.]

ROSE-ENGINE TURNING. [TURNING.]

ROSEMARY. [ROSMARINUS.]

ROSEN, FREDERIC AUGUSTUS, was born on the 2nd of September, 1805, at Hanover, and died in London on the 12th of September, 1837. He received his earliest education from his father, who still lives at Detmold in Westphalia, where he holds a high official situation in the government of the prince of Lippe Detmold. He afterwards went to the gymnasium at Göttingen. In the year 1822 Rosen went to the university of Leipzig, and two years afterwards to Berlin. The energy with which he applied himself to all branches of science and literature, and his great powers for acquiring knowledge, encouraged his friends to form the highest expectations of his future career. At an early period he had become distinguished for his classical attainments and his knowledge of the Semitic languages; but it was not until the year 1824 that he turned his attention to the Sanscrit, a language which at that time was almost unknown in Germany, although its importance in all questions connected with the early history of civilization had been pointed out by the two Schlegels, Creuzer, and William von Humboldt. During a short visit which he paid to his family, he made himself acquainted, with his father's assistance, with the antient language of the Brahmans, in which he received further instruction at Berlin from Professor Bopp, who had just returned from London, and been appointed professor of Sanscrit at the university of Berlin. William von Humboldt, who devoted his time to the same pursuits, also encouraged him to proceed in his Sanscrit studies. The total want of all useful aids towards obtaining a knowledge of this difficult language, suggested to Rosen the idea of supplying the deficiency, which his acquisitions rendered him well able to do. Accordingly, in 1826, when he took his degree of doctor of philosophy, he published his 'Corporis Radicum Sanscritarum Prolusio,' which was only the forerunner of his larger work 'Radices Sanscritæ,' Berlin, 1827. This work, which abounds in learning and sound criticism, has contributed more than any other to recommend and facilitate the study of the Sanscrit language in Germany. It is now out of print, and the author had prepared a second edition, in which he had remodelled his original plan, in order to adapt his work to the then advanced state of Sanscrit literature. Rosen also had applied himself, with the greatest success, to the study of Arabic and Persian; and he had prepared for publication several large episodes of the 'Sháh Náhmah,' the great epic poem of the Persians. This intense application to the literature and the languages of the East gave birth to a strong desire to visit Asia. A favourable opportunity presented itself, and he was appointed attaché to the Prussian embassy at Constantinople. Shortly before he started however he received a flattering invitation to become Professor of Oriental Languages in the University of London (now University College) then just established. He accepted the offer, hoping to find in this country a wide field for his literary labours. Before going to London, he visited Paris, in order to become acquainted with De Sacy, Remusat, and De Chézy; and after a short stay in that city he came to London. But his expectations of honour and profit were greatly disappointed; for though he had a few pupils in Sanscrit, Arabic, and Persian, it soon became evident that a teacher of the Hindustani language was more wanted at the London University than a professor of Oriental languages as the term is understood in Germany. His energy did not however fail him; and seeing that he could be useful in a secondary capacity, he applied himself for several months with great industry to the Hindustani, in order that he might qualify himself to teach the language. Some years afterwards he resigned his professorship of Oriental languages; but subsequently accepted the Sanscrit professorship in University College. The high opinion which the College entertained of his services may be collected from the Annual Report of the College for the year 1837-38, which was made after his death.

He derived more satisfaction from his occupation as honorary foreign secretary of the Royal Asiatic S
as secretary to the Oriental Translation Comm
just established. This brought him into comn
with that great Oriental scholar Colebrooke, fo
entertained the highest admiration. By Colebrook
he published, under the sanction of the Transla
mittee, the Arabic text of the 'Algebra of Moh
Musa,' with an English translation, accompanie
cellent notes [MUSA]; he also prepared for publi
great 'Biographical Dictionary' of Ibn Khallikan
as well as another work, in which he intended
comprehensive view of the system of Indian juri
was never completed.

Amidst these various occupations he had not
of a higher and more arduous task, in which he
concentrate all his attainments. Having disco
the character of the Indian literature and langu
only be completely understood by tracing them b
earliest periods to which the 'Vedas' belong, he
remove the obscurity by which they are s
In 1830 he published his 'Rig Vedae Specime
London, and from that time his principal a
directed to this great object. In order to unde
obsolete language of these antient writings, he ha
the oldest of the grammatical works of the Hindu
done this, he applied himself to the Commentar
a full knowledge of which the texts are quite un
All this was done under very disadvantageous circu
and it is a matter of great regret that he was
in a situation which would have made other lab
cessary.

Among his various literary labours at this perio
revision of the 'Dictionary, Bengali, Sanscrit, and
published by Sir Graves Houghton, London, 183
also made the 'Catalogus Codicum Manuscriptor
corum et Carshunicorum in Museo Britannico,'
been published, since his death, under the care of
Mr. Forshall, who in his address to the reader
attributed to Dr. Rosen all the merit of this
Unfortunately Dr. Rosen's name does not appear
the title-page of this catalogue, nor after the præf
he wrote, and which is printed at the head of the
To qualify himself for this labour, Rosen mad
master of the Syriac language, with which he wa
imperfectly acquainted. At Colebrooke's request
took the collection of his 'Miscellaneous Essays,' t
added an excellent index, 2 vols., London, 1827.
wrote all the articles relating to Oriental literatu
work, from the article 'Abbasides,' to the article '
Language,' both included, 'together with several
Eastern Geography, such as 'Arabia' and 'Armeni
vised the work on the Hindus, which was publis
'Library of Entertaining Knowledge;' the chapt
literature is entirely by his hand. For the 'J
Education' he wrote a review of Bopp's 'Vergl
Grammatik,' &c. (vol. viii.), and two reviews
'Etymologische Forschungen' (vols. 9, 10). He m
a constant correspondence with almost all the dist
scholars on the Continent, and for the last ten ye
life no important publication connected with East
logy or history was projected on the Continent to
did not contribute either by his advice or by the
materials. His worth was fully appreciated on
tinent, and a desire was often expressed that
return to his native country; but being anxious
plish his design of publishing the 'Vedas,' and c
that he was placed in a wider sphere of utility in
he preferred remaining in London, where he f
valuable treasures of Oriental literature.

In the year 1836 he began to print the collecti
hymns of the 'Rig Veda,' giving the Sanscrit tex
translation, and explanatory notes. In the autum
he had advanced so far that he intended to publi
volume, when his sudden death, in the prime of li
the full vigour of his intellectual powers, interr
undertaking for which no man in Europe was so
lified or prepared as himself. The Translation C
published the book after his death, as far as it
pleted, under the title 'Rig Veda Sanhita Liber
Sanscrite et Latine,' London, 1838, 4to. Those
hereafter profit by the study of this work, shou
at what price it has been obtained: it is only a
but it contains the energy of a whole life. Rosen'

papers and collections have been confided for publica- the able hands of Professor Lassen of Bonn.

hough Rosen had acquired so honourable a rank as ntal scholar, his position in society was no less dis- sned. The highest admiration for his talents and at- ents was accompanied with universal respect for his The simplicity of his pure and elevated mind, the ness of his manners, and, above all, the genuine ess of heart which formed the striking feature of his ter, secured for him, in an eminent degree, the affec- all who knew him. His readiness on all occasions and advise his literary friends, at any cost of labour, known to many who will read this notice.

loss of such a man will always be severely felt by it especially by those who were intimately acquainted him. His numerous friends, both English and Ger- have presented his father with a marble bust of his y Richard Westmacott, as a mark of their esteem for aracter and regret for his loss, and have erected a ment to his memory in the cemetery at Kensall Green ondon, where he is interred.

SENMÜLLER, JOHN GEORGE, was appointed sor of Divinity in the University of Leipzig, and ntendent in the Lutheran church at the same place 5, and died in 1815. His chief works are: 1, 'Historia retationis Librorum Sanctorum in Ecclesia Chris- ab Apostolorum Aetate ad Literarum Instaurationem,' s, 8vo., 1795-1814; and 2, 'Scholia in Novum Testa- m,' 5 vols. 8vo. The latter is a useful work, especially ung students, but the author cannot be placed in the nk of commentators. His labours were more directed explanation of particular words and phrases than to the l comprehension of the sacred writings. He seldom a satisfactory solution of any formidable difficulty.

SENMÜLLER, ERNEST FREDERIC CHARLES, the preceding, was born in 1768, and died on the of September, 1835, after having for many years held fice of professor of oriental languages in the Univer- Leipzig. His chief works are: 1, 'Scholia in Vetus mentum,' 23 vols. 8vo., which is a philological and al commentary on the Pentateuch, Isaiah, the Job, Ezekiel, the minor prophets, Jeremiah, the gs of Solomon, Daniel, Joshua, Judges, and Ruth. rst edition was published 1795-1826, the second 1823- In the second edition several Rationalistic interpreta- which appeared in the first are greatly modified. müller's profound oriental learning and untiring try have made this work one of the very best com- ries upon the Old Testament. In some cases he too much to the interpretations of the Jewish Rabbis. mpendium of the Scholia,' in 5 vols. 8vo., containing entateuch, Isaiah, the Psalms, Job, Ezekiel, and the prophets, has been executed by Dr. J. C. S. Lechner, the author's superintendence. Rosenmüller did not complete his larger work. 2, 'Handbuch der Bibli- lterthumskunde,' 4 vols. 8vo., 1823-31. This work lso left incomplete at the author's death. The volumes d are, three on the geography and one on the natural of the Bible. Translations of parts of this work are hed in the 'Biblical Cabinet,' namely, 'The Geography ral Asia,' 2 vols., and 'The Mineralogy and Botany of le,' 1 vol. 3, 'Institutiones Linguae Arabicae,' the nual of Arabic grammar, chiefly founded upon De Grammaire Arabe.' 4, 'Analecta Arabica.' 5, 'Voca- ium Veteris Testamenti.' 6, 'Das Alte und das Neue nd,' 6 vols. 8vo.

TA, or EL RASCHID, a town of Lower Egypt, ed in 31° 25′ N. lat. and 30° 28′ E. long., on or west bank of one of the principal branches of the and about four miles from its mouth. It is said to been built by the son of the celebrated Haroun-al- l, about A.D. 875; but it did not become a place of te till the decline of Damietta, owing to the increase e bar at the mouth of the Nile, which prevents large ls from entering the river.

setta at the present day is not so large as Damietta: its tion amounts to about 9000, among whom are several s and Copts. The country around Rosetta is a com- garden, but the town itself does not deserve the es which have been bestowed upon it by some travel- It contains several large mosques; the streets, are exceedingly narrow, not more than two yards wide, lie parallel to each other in a line with the river, and are irregularly intersected by others which are shorter. Between the houses and the Nile there is a wide space, which is the promenade of Rosetta. The houses, which are built of a dingy red brick, are two or three stories high; the bazaars are narrow, dirty, and dark. Rosetta carries on a considerable trade both with Europe and the Levant; but the passage of the bar at the mouth of the Nile is always attended with some danger, as the sands are constantly shifting, and the surf is high.

ROSETTA STONE is the name given to a stone in the British Museum, which was originally found by the French among the ruins of Fort St. Julien, which is near the Rosetta mouth of the Nile. It was delivered up to the British on the capitulation of Alexandria, and was brought to England in the year 1802. This stone, which is a piece of black basalt, contains parts of three distinct inscriptions: the highest on the stone is in what we generally call hieroglyphics; the second is in that character commonly called the 'enchorial,' or 'the characters of the country;' and the third, which is in Greek, declares, at the end, that the decree which this stone contains was cut in three different characters, the 'sacred characters,' 'those of the country' or the 'enchorial,' and the 'Greek.' In its present state the stone is much mutilated, chiefly at the top and at the right side. Its greatest length, in its present condition, is about three feet, measured on the flat surface which contains the writing; its breadth, which in some parts is entire, is about two feet five inches. A large part of the hieroglyphic inscription is broken off, but it probably contained in its entire state about twenty or at the utmost twenty-one lines; the enchorial or second inscription consists of thirty-two lines, but the beginning of the first fifteen lines are wanting, and the Greek text contained, when entire, fifty-four lines, but the end of it is at present mutilated. We learn from the Greek text that the Rosetta stone was erected in the reign of Ptolemy V., Epiphanes, and probably about B.C. 193. Epiphanes succeeded to the throne on the death of his father Philopator, B.C. 205, when he was a child only four or five years old. In this monument the acts done during the prince's minority are attributed to him, and he is commended for his piety, his liberality to the temples, his remission of the arrears of taxes and diminution of the imposts, his victories over the rebels, and his protection of the lands by dams against the inundations of the Nile.

The discovery of this stone with the triple inscription upon it excited hopes that we should be able by means of it to decipher the numerous monuments of antient Egypt. Dr. Young, in the article 'Egypt,' in the supplement to the 'Encyclopædia Britannica,' was the first who deciphered several proper names in the enchorial and hieroglyphic inscriptions, and he was followed in his investigations by Champollion. This triple inscription however is not of so much value as it appears at first sight, since it is almost certain that the enchorial text is not faithfully represented by the Greek. It is, on the contrary, more probable that the Greek is not a translation either of the hieroglyphic or enchorial text, but expresses only generally the same substantial meaning.

The preceding account has been taken from the 'Egyptian Antiquities' of the British Museum, in the *Library of Entertaining Knowledge*, vol. ii., chap. 10, in which the whole subject is fully investigated. Compare also the articles CHAMPOLLION and HIEROGLYPHICS in this work.

ROSHEIM. [RHIN, BAS.]

ROSICRUCIANS is the name of a secret society whose existence became first known to the public in the 17th century, by means of several publications which have been attributed to John Valentine Andreæ, a German scholar, born at Herrenberg, in the duchy of Würtemberg, in 1586, who, after studying at Tübingen, became a minister of the Lutheran church, and in course of time was made almoner of the duke of Würtemberg and abbot of Adelberg. Andreæ died in 1654. He was a man of a mystical turn of mind, who had conceived the idea of effecting a general reform of mankind. He wrote many works, chiefly on mystic subjects. It is doubtful however whether those particular works which would establish his connection with the Rosicrucian Society are really his. The following are the titles of three of these works:—1, 'Elucidarius Major, ueber die Reformation der ganzen weiten Welt, F. C. R. auss ihren chymischen Hochzeit,' 1617, in which there is a mixture of precepts of alchemy with maxims of ethics. 2, 'Fama Fraternitatis des löblichen Ordens des

Rosenkreuzes,' Frankfort, 1617, in which there is a story of a certain Christian Rosenkreuz, a German noble of the fourteenth century, who, after travelling long in the East, returned to Germany; and there established a fraternity, or secret society, of a few adepts, under certain regulations, living together in a building which he raised under the name of Sancti Spiritus, where he died, at 106 years of age. The place of his burial was kept a profound secret by the adepts, and the Society renewed itself by the admission of successive new members in silence and obscurity, according to the last injunction of its founder, who directed the following inscription to be placed on a door of Sancti Spiritus:—' Post CXX. annos patebo.' 3. ' Confessio Fraternitatis Roseæ Crucis ad Eruditos Europæ,' which is appended to the preceding, and in which it is stated that the Order does not interfere with the religion or polity of states, but only seeks for the true philosophy; that many absurd fables have been told of the fraternity, either by its enemies or by fantastic people. It states also that once a year the members are to meet at appointed places to converse together upon secret matters, and that new members are to be admitted to supply the place of those who are deceased, and to work for the common purpose of the Order, giving no clue however for discovering what that purpose was. In fact the secret, if secret there was, has been effectually kept to the present day. This appearance of mysteriousness has given rise to various surmises. Some have ascribed to the Rosicrucians the same hostile plans against all established churches and monarchies which have been also attributed to the Illuminati, Freemasons, Carbonari, and other secret societies. (Barruel, *Mémoires pour servir à l'Histoire du Jacobinisme.*) Others say that the order of Rosicrucians is identical with that of Freemasons, one of whose degrees or dignities is called in some countries the degree of the Red Cross. The Rosicrucians have not been heard of as a separate order for nearly a century past, but some have thought that they continued to exist under the name of the Illuminati, who were much talked of in Germany and France in the latter part of the eighteenth century. Barruel, after describing the ceremonies with which candidates were admitted to the degree of Red Cross in some Freemasons' lodges, which however, he says, vary in different countries, observes that these ceremonies, which were apparently allusive to the Passion of Jesus Christ, were differently interpreted, according to the dispositions of the candidates; that some saw in it a memento of the Passion, others an introduction to the arcana of alchemy and magic, and others at last a blasphemous invective against the founder of Christianity, which the Rosicrucians had derived from the Templars of old. This assertion however has been contradicted by others. The reader who wishes to investigate this obscure subject may consult F. Nicolai, ' On the Crimes ascribed to the Templars;' Chr. Murr, ' On the True Origin of the Rosicrucians,' 1803: and J. G. Buhle, Ueber den Ursprung und die vornehmsten Schicksale der Orden der Rosenkreuzer und Freymaurer,' Göttingen, 1804. Buhle seems to thinks that the Rosicrucians are but a branch or affiliation of the Freemasons. The impostor Cagliostro pretended that he was a Rosicrucian. [CAGLIOSTRO.]

ROSIN. [TURPENTINE.]

ROSMARI'NUS, a genus of plants belonging to the natural order Lamiaceæ. It is one of the genera belonging to this order that are perennial and possess the character of shrubs. It is known by the following characters —calyx ovate, campanulate, with two lips, the upper of which is entire, and the lower two-parted; corolla not ringed in the inside, the throat slightly inflated with two lips, equal, the upper one emarginate, the lower two-parted, the middle lobe very large and hanging down; stamens two; filaments slightly toothed at the base; style with the upper lobe very short.

Rosmarinus officinalis, the common Rosemary, is an inhabitant of the southern parts of France, Spain, and Italy, the basin of the Mediterranean, and some parts of Asia Minor. It is a very leafy shrub, growing to the height of three or four feet; the leaves are sessile, linear, quite entire, revolute at the edge, and covered with white hairs beneath; the flowers are few, and in short axillary racemes; the corolla has a dull leaden blue or white colour, with the tube protruding a little beyond the calyx, the flower-leaves or bracts are shorter than the calyx. The cultivated and garden plants differ very much in the shape and number of their leaves, on which account Miller described them as two species, the *R. angustifolia* and the *R. latifolia*. The size of the leaves varies according to the soil and situation in which the plant grows. It is generally observed that the broader and longer the leaves, the more vigorous is the plant. The rosemary is a very desirable plant for the garden, both on account of its evergreen character and its flowers, which appear from January to April. There are three varieties known in gardens, the green or common, the gold-striped, and the silver-striped, which are distinguished principally by the colour of their leaves. The green variety is the hardiest, and is most generally used. It may be propagated by seeds, or slips or cuttings of the young shoots. The striped varieties may be best propagated by layers of the young wood. They should be planted in a warm situation, as they are much more tender than the green. They are only cultivated as ornamental plants on account of their variegated leaves. The rosemary abounds in the district of Narbonne in France, where it is used to form hedges for gardens, &c. It is supposed to be the aroma of this plant gathered by the bees that gives to the honey of this district its peculiarly fine flavour.

Rosemary was formerly held in high estimation, especially on the Continent. In the songs of the troubadours it is frequently mentioned as an emblem of constancy and devotion to the fair sex. It was thought to be a comforter of the brain, and a strengthener of the memory; and on the latter account used as a sign of fidelity amongst lovers. Shakspere makes Ophelia say,—

> 'There's rosemary for you; that's for remembrance.'

In some parts of Germany rosemary is grown in large quantities in pots for the purpose of selling small sprigs of it when in blossom, in winter and early spring, for various religious purposes.

ROSMARI'NUS OFFICINA'LIS, *Rosemary*, called also Anthos, a term which is apt to lead to the confounding of Rosemary with the Ledum palustre or wild marsh-rosemary, which has very different and even dangerous properties. Genuine Rosemary is a shrub, a native of the south of Europe, Asia Minor, and China. The officinal part is the tops or upper part of the twigs. The leaves are about an inch long, linear, slightly revolute at the margins, dark green and reticulate on the upper surface, hoary and white on the under. The leaves and calyces of the flowers have a strong, penetrating, aromatic odour, which is rendered stronger by bruising them; and a bitter, burning, camphor-like taste. They owe this to the presence of tannic acid, bitter matter, perhaps resin, and especially to a volatile oil, of which one drachm may, by distillation, be obtained from one pound of the leaves.

Oil of Rosemary (Oleum Rorismarini, or Ol. Anthos) is chiefly prepared in Spain and the south of France, by distillation of the leaves and flowers. At first it is nearly transparent and very limpid, but by time it becomes both yellowish and thicker. It possesses the strong penetrating odour of rosemary, with a camphor-like intermixture, and a burning taste. It has an acid re-action. The specific gravity varies with the purity and age of the specimen; it is commonly 0·91, but by rectification with alcohol it is brought to 0·89 or 0·85. It mixes with alcohol of ·83 in every proportion. By evaporation or by shaking with potass, it deposits a stearopten, or rosemary-camphor. Hydrochloric acid gas blackens it, but does not form an artificial camphor. With iodine it partially explodes.

The oil of rosemary of commerce is an artificial preparation of oil of turpentine distilled with rosemary; it is also adulterated with spike oil, obtained from the Lavandula Spica. This may always be distinguished from the genuine by not reddening litmus-paper

Rosemary possesses valuable stimulant and carminative properties; but it is chiefly employed as a perfume, entering into the composition of the Queen of Hungary's Water, Eau de Cologne, and aromatic vinegar. It is also said to promote the growth of hair and prevent baldness.

ROSS and CROMARTY SHIRES, two Scotch counties, intimately connected both locally and otherwise. Ross comprehends a considerable area on the mainland of Scotland, together with the large island of Lewis, one of the Hebrides; and Cromarty is composed of a number of detached portions, either interspersed among the inland part of Ross or lying along its border The mainland portion of the two counties approximates in figure to a triangle having its vertex (Tarbet Ness) towards the east, one side facing the north, extending from Tarbet Ness to Loch

;9 miles in a direct line between its extremities; side, fronting the south-east, extending from Tarbet the narrow strait which separates Skye from the d, 83 miles: and the base or third side, fronting ;, 62 or 63 miles. The northern side is for the most terminous with Sutherlandshire, the south-eastern h Inverness-shire; but towards Tarbet Ness, Ross marty shires are separated from Sutherlandshire by ı Frith; and from Inverness-shire, and also from ınd Elgin shires, by the Moray or Murray Frith. th of Cromarty, between these two, penetrates 10 land, forming a long narrow inlet, little more than s wide in the broadest part, and communicating with ı sea by a passage of scarcely more than half a mile. d side is formed by the coast of the Atlantic, and is rized by bold headlands separated from each other but generally narrow inlets or lochs. There are small islands, the Summer Islands, Martin, Eilan-ı, Longa, the Croulin Islands, &c., off this coast. ınd of Lewis is to the north-west of the mainland the county: the distance between the nearest point sland and the nearest point of the mainland, across oh, or intervening channel, is about 25 miles. Lewis strictly speaking, an island of itself; it forms the ı and by far the larger portion of the principal f the Hebrides, sometimes, though rarely, called the land; the southern portion, called Harris, belongs 'ness-shire. Lewis is 39 miles long from north to rom the northern promontory, called the Butt of the o the border of Harris, and 31 miles broad from west: its coast-line is as irregular as that of the d. The islands of Bernera and Scarpa lie close to n the western side. The Shiant Isles are a group l islands or rocks between Lewis and the main, but earer Lewis.

ırea of the two counties is given by Dr. Playfair (*De-n of Scotland*) thus:—Ross-shire, 2070 square miles, ,800 acres; Cromartyshire, 105 square miles, or 67,200 Lewis (including the fresh-water lakes), 557 square 356,480 acres: total, 2732 square miles, or 1,748,480 Mr. MacCulloch's estimate (*Statistical Account of 'ish Empire*) is as follows:—Ross-shire, 2069 square 1,324,160 acres of land; 60 square miles, or 38,400 lakes: together, 2129 square miles, or 1,362,560 Cromartyshire, 256 square miles, or 163,840 acres ; 10 square miles, or 6400 acres of water: together, are miles, or 170,240 acres. The isles belonging to d Cromarty:—560 square miles, or 358,400 acres of 0 square miles, or 12,800 acres of lakes: together, ıare miles, or 371,200 acres. The total is 2885 miles, or 1,846,400 acres of land; 90 square miles, 00 acres of lakes: together, 2975 square miles, or 0 acres. The population, in 1821, was 68,828; in was 74,820, showing an increase in ten years of ent., and giving, on Mr. MacCulloch's statement of ı of the land (viz. 2885 square miles), nearly 26 in-s to a square mile. The shires taken together ıı area all the counties of Scotland except Inverness gyleshire: in amount of population they are ninth , standing next below Inverness, and next above es; in density of population they are exceeded by all nties of Scotland, except Inverness and Sutherland. e county town of Ross, is near the southern shore och Frith, in 57° 48′ N. lat. and 4° 3′ W. long., 134 n a direct line north by west of Edinburgh, or 201 y the road by Queensferry, Kinross, Perth, Dunkeld, thol, the valleys of the Garry and the Spey, to In-and from thence by Beauley, Dingwall, and In-on.

district of Ferrintosh, which is a portion of Nairn-s included in the boundaries we have given, but not statements of area and population.

ace; Coast-line; Islands.—A general description of strict is given elsewhere [Great Britain, vol. xi., col. 2], where it is described as 'the country south of ining Loch Broom and the Frith of Dornoch.' ient here to notice that, excepting the two penin-us d by the three friths Dornoch, Cromarty, and the parts immediately adjacent to them, it con-mountains irregularly grouped, with deep intervening r ravines. Ben Wyvis is 3720 feet above the level a: Kea Cloch, near Little Loch Broom, 3600 feet: one of the Ben More hills, near the head of Loch Broom, 3551 feet; Ben Lair, near Loch Maree, 3000 feet; Ben Attow, on the border of Ross-shire and Inverness-shire, is said to be nearly 4000 feet.

The three friths just mentioned are three branches of that great bay which penetrates Scotland from the north east, between Duncansby Head, the north-east point of Scotland, and Kinnaird's Head in Aberdeenshire. Dornoch Frith, the most northern of the three, extends about 24 or 25 miles inland to Bonar Bridge, on the road from Inverness to Wick and Thurso. It is about 10 miles across at its entrance between Tarbet Ness and Brora. Moray Frith extends about as far inland as Dornoch Frith, but is 14 miles across at its entrance between Tarbet Ness and Burg Head. Cromarty Frith is an inlet of Moray Frith. Loch Beauley is an extension of Moray Frith inland: we know not exactly where the line separating the loch from the frith is drawn, but there is a sheet of water extending 16 or 17 miles inland from Fort George, where Moray Frith is contracted to a narrow strait, and three or four miles broad at the widest part. There are cliffs on each side of the entrance of Cromarty Frith, and again at Tarbet Ness and some miles south of it.

The principal inlets on the western or Atlantic coast are Loch Enard, at the north-west extremity of the two counties · Loch Broom, Little Loch Broom, Loch Greinord, Loch Ewe, Loch Gairloch, Loch Torridon, Loch Carron, with Loch Kishorn, which is a branch of it; and Loch Alsh, with its branches, Loch Ling and Loch Duish or Duich. They occur in the order in which we have enumerated them from north to south. Loch Broom and Loch Carron extend about 15 miles inland, but are both narrow. Lochs Enard, Greinord, Ewe, Gairloch, and Torridon are not so long, but are wider. Loch Greinord is about four miles across at the mouth. There are cliffs on the shore of Loch Enard and at the headland of Ru-mone or Ru-more, at its western side, and on part of the shores of Loch Broom and Loch Carron. The islands along this coast are small. The western coast of Cromarty and Ross is described at considerable length in the second volume of MacCulloch's 'Highlands and Western Isles.'

The principal inlets on the coast of Lewis are Loch Carlowa, Loch Bernera, Loch Roig, Uig Bay, and Loch Resort, on the west side, occurring in the order in which we have enumerated them from north to south; and Loch Tua, Loch Gremishader, Loch Luerbost, Loch Hourn, Loch Shell, Loch Brolum, Loch Valumis, Loch Clay, and Loch Seaforth, occurring in the same order, on the eastern side. The three lochs Carlowa, Bernera, and Roig are three branches of one great inlet, about nine miles across at the entrance, and extending about nine miles inland: in the middle of it is the island of Bernera, five miles long from east to west and three miles wide, and a number of smaller islands. The boundary between Lewis and Harris is drawn across the island from the head of Loch Resort to the shore of Loch Seaforth, but not at the head of the Loch. There are cliffs at the northern extremity, and on a great part of the eastern and some part of the western coast of Lewis. It will be observed that these 'lochs' are not, as the name would seem to imply, lakes, but inlets of the sea. The headlands of Lewis are the Butt of Lewis at the northern extremity; Tolsta Head, near it; and Tiompan Head, at the extremity of the peninsula which forms the southern and eastern sides of Loch Tua, on the eastern side of the island; and Gallan Head, at the south side of the entrance to Loch Roig, on the western side. Lewis is as mountainous as the mainland, though the peaks are not so lofty: the mountains form a range extending north and south, with lateral branches. The Barvas Hills, near the centre of the island, are 780 feet high; and Suaneval, on the western side, between Loch Roig and Loch Resort, 2700 feet.

Hydrography and Communications.—The two counties have no very large rivers. The Oikel rises at the foot of Ben Mohr in Sutherlandshire, just on the border of Ross-shire, and flows for twenty-six miles along the border of the two counties till it unites with a stream from Loch Shin in Sutherlandshire. It then expands into a narrow lake five miles long, called the Kyle, which opens into Dornoch Frith. The Repath Water and Carron Water are one stream twenty-three or twenty-four miles long, which joins the Kyle at its lower end. A number of streams flowing eastward unite above Dingwall, just below which they fall into Cromarty Frith. The longest of these streams rises in the western part of the county, and has a course of forty miles to Dingwall, watering Strath Bran, and passing through several lakes, among which is Loch Luichart, nearly five miles long by one broad. Loch Fannich, eight miles long and a mile broad, is drained by another of these streams: it is near the centre of the counties. Loch Monar, five miles long by one mile broad, is drained by a stream which belongs to Inverness-shire; Loch Glass, five miles long, and many other lakes, most of them very small, are drained by streams flowing into the friths of the eastern coast. All the above-mentioned lakes have their greatest extension from east to west.

The streams on the western coast have a shorter course than those on the eastern. There are several lochs in this part. Loch Maree, the largest fresh-water lake in the counties, extending twelve miles in length, and two miles or two miles and a half across in the broadest part, is drained by the Ewe, which flows into Loch Ewe. Loch Na Shallag, three miles long; Loch Fair or Fuir, three miles long and above a mile wide; Loch Dambh or Damff, four miles long; Loch Lundie, three miles long; and Loch Clunie, partly in Inverness-shire, nearly four miles long, are drained by streams which flow into the sea on the west coast.

Lewis abounds in lakes; but they are all small, except Loch Langavat, which extends in length nearly ten miles from north to south, between Loch Seaforth and Loch Resort. The streams in Lewis have all a very short course.

The two counties have very few roads. The greater part of them, including those of chief importance, are on the east side, and lead to different places farther north. One leads near the coast from Inverness, by Fortrose, Cromarty, and Tain, to Dornoch, Wick, and Thurso, the communication being made in several places by ferries over the lochs and friths. Another road from Inverness to Wick and Thurso runs more inland, passing round the heads of Loch Beauley and the Frith of Cromarty, and through the town of Dingwall, which is at the head of Cromarty Frith: it crosses into Sutherlandshire by Bonar Bridge, which is thrown over the Kyle at the head of Dornoch Frith. There are several roads communicating between these two. A road from Dingwall leads across the country through Strath Bran to Loch Carron, a distance of 49 miles, sending off branches on the right to Ullapool on Loch Broom, to the heads of Loch Gairloch and Loch Ewe, by the side of Loch Maree, and to Loch Torridon. The road from Inverness to the Isle of Skye, with a branch to Loch Alsh and Loch Carron, runs through Rhiabuie and Glen Shiel, in the southern parts of the county of Ross; and that from Dornoch and the east coast to Loch Assynt just passes through the northern part of the same county. The greater part if not the whole of these roads are under the direction of the commissioners of Highland roads and bridges.

Soil; Agriculture.—The arable land of the two counties is almost entirely confined to the eastern part, comprehending the two peninsulas, 'An Oilean Dubh,' or the Black Isle, between Loch Beauley and Cromarty Firth; and Easter Ross, between the Cromarty and Dornoch friths, together with the comparatively low and level tract immediately adjacent to these. The central and western parts are 'wild, rugged, and mountainous, interspersed with lakes and narrow glens that afford pasture for sheep and black cattle.' (MacCulloch, *Statist. Acct. of Brit. Empire.*) Since the commencement of the present century, agriculture has improved in a most extraordinary manner. 'The fields were formerly detached pieces of land, ploughed irregularly, as the ground with the least labour suited. The carts generally used were of the poorest description, with a kind of tumbler or solid wheel, and wicker conical baskets; little or no lime was used for agricultural purposes.' 'I succeeded to a farm in this country about thirty years ago (says Major Gilchrist, of Opisdale, Sutherlandshire), when the working strength consisted of sixteen oxen and twenty-four small horses called garrons; this farm is now laboured by three pair of horses.' (*Appendix to Fourteenth Report of Commissioners of Highland Roads and Bridges; Parl. Papers* for 1828, vol. ix.) The individual who introduced the ploughing of land in regular ridges, and the division of fields into anything like systematic arrangement, was living in the employ of Major Gilchrist at the period of the above Report. 'The total amount of wheat then (viz., at the commencement of the present century) raised in the county was not equal to what is now produced on many single farms. It was not until 1813 that the first barley-mill north of the
Cromarty Frith was erected, and in 1821 the first
(at Drummond, on the estate of Fowlis) by the
vidual. To such an extent however has cultivati
been carried, that the growth of wheat alone is now
estimated at 20,000 quarters annually; and the exp
grain to London, Leith, Liverpool, &c. during the
amounted to upwards of 10,000 quarters; besides
of the extensive and populous pastoral distric
county (of Ross), and the towns of Dingwall, Ta
ness, &c., to which places I am credibly informed
of 10,000 bolls of flour are now annually sent fo
sumption of the inhabitants. Among other export
mentioned the produce of various extensive whis
leries, situated in different parts of the county, a
siderable quantity of salted pork from the ports of
and Invergordon.' (*Appendix to Report*, as abov

The soil in the peninsula of the Black Isle is va
much of it poor. The cultivated portion consists
clayey loam, good black mould, and sandy loam.
Ross there is a considerable extent of clayey loam
sandy soil. Around Dingwall the soil is clayey.
more than the usual number of gentlemen's seats
tations in the cultivated part of the two counti
usual fences are hedges and ditches, sometimes
stone fences are employed. There is some good
the hedgerows. Turnips are grown equal to those
southern counties. The crops are clean, and for
part rich. The houses of the principal farmers are
commodious, and the cottages of the peasantry h
improved of late years. Many of the mansion-h
well situated, and surrounded by ornamental p
shrubberies, or fine timber-trees. Many of them
cellent gardens; and a spirit of horticultural i
is very general. The gardens of the farmers, th
are well stocked; and the cottagers are fond o
garden, whenever they have a suitable piece of
Much, very much of the improvement in agric
to be ascribed to the improved communications for
maintained by the government commission for
roads and bridges. In some parts indeed, ignoranc
judice, or perhaps poverty, has induced an adh
antient practices and a sturdy rejection of impr
thods.

'A marked improvement in domestic animals of
scription has taken place in the northern counties
improved communication with the south. I nee
allude to the introduction of the Cheviot sheep, to
taken in improving the breed of cattle by the im
of the most improved sorts from the West High
of cows from Ayrshire. Considerable attention
recently paid to the breed of horses, both for the
of agriculture and draught; and, in some instances
the finest description have been successfully rear
has the breed of pigs been neglected; several
species, both pure and crosses, having been int
(*Appendix to Report*, as above.) The original na
of cattle is hardy and compact, adapted to the
Cattle were formerly more numerous than at pre
were much employed in agricultural labour, but t
them is now almost entirely given up. The dimi
their number is ascribed to the greater attentio
sheep-farming.

The western side of the county, where it has
thrown into large sheep-farms, is occupied by a
of tenants. They have some arable land, in which
barley, and oats are raised; but the number of ac
cultivation is not great, nor has planting been c
any extent. The greater part of the country is
waste. The houses of many of the peasantry, inclu
small tenantry and the cotters, are very poor;
built of turf, others with stone, with or without mo
have a roof of turf with heather or fern above it.
commonly destitute of chimneys; the fire is kindle
wall, or a stone in the centre of the room; the smoke
as it can, by roof, door, or windows, which last a
at will with wooden shutters. The floor is made of
clay. In many houses the cattle dwell under
roof, and even enter at the same door with the f
which they are separated by a partition of boa
or wattles, having a door in the middle. Some of
are getting into the way of building separate sheds
cattle. The food of the peasantry consists of potat
rings, and oatmeal gruel. Those in better circ

ı addition, butter, cheese, oatcake; and in winter
ing, have broth and mutton, in place of herrings.
the common fuel, but the better class of farmers
ıl. There has been much improvement in agricul-
ıplements. Iron ploughs, drawn by two horses, and
by the ploughman without a driver, are now in use,
of the old plough with four horses, a ploughman, a
nd two other persons to keep down the plough in
und and level the rigs. The crooked spade is still
ıere there is but little pasture for horses or where
ınd is too rough and rocky for the plough. Along
ıt the peasantry are to a considerable extent engaged
herring fishery. Smuggling and illicit distillation
one time common, but are now given up in most
Poaching is comparatively rare. Deer are tolerably
us in some places, not in others; roes and hares are
nerous. The fox, badger, polecat, weasel, marten,
ıt, and mouse are common; as are the eagle, raven,
ariety of hawks and owls. Plovers are frequently
h; grouse are perhaps diminishing. The smaller
usually possess a considerable extent of grazing-
sometimes near their arable land, sometimes remote
they occupy the straths or valleys.

are stone-quarries in some parts of the two counties,
e mineral productions are comparatively unimportant.
ıve limestone, but no coal.

herring fishery is carried on along the eastern and
shores; but this branch of industry has declined on
tern side. The salmon fishery is carried on in the
nd æstuaries of the eastern coast.

ions, Towns, &c.—The two counties are divided into
ıree parishes, two of which extend into the adjacent
viz. Urquhart, a portion of which (the district of
sh) constitutes a detached part of Nairnshire, sur-
on every side by Ross-shire; and Urray, of which
portion is in Inverness-shire. The parishes are all
ıs compared with the average extent of English
but those on the eastern and more cultivated side
by any means so large as the Highland parishes of
t, which have in some cases an extent of twenty,
r even forty miles. There are four royal burghs,
n, Cromarty, Dingwall, and Fortrose, and one
f barony, viz. Stornoway, in the isle of Lewis.

is on the shore of Dornoch Frith, in the north-east
he county. The parish extends nine or ten miles in
rom north-east to south-west, and above four miles
lth. Tain appears to have been incorporated very
is said by Malcolm Canmore; but the earliest
extant is of James VI., A.D. 1587. It was early cele-
or a chapel of St. Duthus, bishop of Ross, which
ht of sanctuary. The sanctuary was violated and
el burnt, A.D. 1427 or 1429, by a Highland chieftain
therland: the chapel was never rebuilt. The town is
on a ridge or terrace chiefly composed of a stratum
lay overlying the sandstone which forms the higher
of the parish, and overlooking a low plain which
from the foot of the terrace on which the town
o the present shore, a quarter of a mile distant. This
n consists of a bed of peat, in which are observed
ıks of trees, chiefly oaks, the remains of a forest, the
f which has formed the peat-bed; over which ex-
bed of sand and shells, and over that a cultivable
soil, on which the sea is gradually encroaching, and
in some parts already converted into waste by the
with which it has been overblown. One or two
ise near the town and flow through the plain into
and on the east side of the town another stream, the
larger than these, flows also into the sea. Tain is ill
nd is irregularly built, but has much improved of
rs, the streets having been somewhat straightened
more unsightly buildings removed. The houses are
built of a fine white sandstone quarried in the upper
he parish: the quarries are the common property of
ghers. There are a large substantial church, built
at the east end of the town; a handsome manse, or
ge-house; an academy erected and endowed by sub-
n in 1813, one of the most tasteful edifices in the
Scotland; a handsome town and county house; and
serving for part of the county, but under the direc-
e burgh magistrates.

are the ruins of St. Duthus's or St. Duthac's
the low plain east of the town, near the little river
y are composed of granite cemented with lime, and are remarkable for the strength and simplicity of their architecture: a church dedicated to St. Duthus, and now deserted, stands in the centre of the town; it is a large Gothic building, and was erected, A.D. 1471, forty years after the destruction of the chapel. There are the ruins of an old prison tower with five spires, once the most conspicuous edifice in the town, but destroyed by fire some years ago.

The population of the parish, in 1831, was 3078, about one-sixth agricultural; a subsequent enumeration (*New Statistical Account of Scotland*, 1837) makes them amount to no more than 2915, of whom 1725 were in the town, 151 in the village of Inver, a fishing station in the eastern part of the parish, and 1039 in the country. The principal trade of the town consists in the supply of the surrounding parts of Ross, Cromarty, and Sutherland shires. There are an iron-foundry, a brewery, a saw-mill, a flour-mill, a carding-mill, and a dyeing-mill. Fishing, chiefly for haddocks and flounders, is carried on at Inver. The salmon-fishing and mussel-fishing are carried on by strangers, who purchase the right to them from the corporation. There are two weekly markets on Tuesday and Friday, and three fairs in the year, held at Lammas, Midsummer, and Michaelmas. The chief fuel is English coal and peat, which are frequently used together.

There are the parochial school, the academy, two female boarding and day schools, one of them supported by the burgh funds, two private English schools, and a private 'class' for young children of both sexes in the town, and a Gaelic Society school in or near the village of Inver, in the parish: the whole number taught in these schools, in 1837, was 302 boys and 184 girls; together 486. There is a library attached to the academy, and there is a public reading and news room. The Northern Missionary Society, which embraces in its operations the counties of Inverness, Ross, and Sutherland, has its seat at Tain; the yearly meeting of the Easter Ross Ladies' Missionary and Bible Society is also held here; and there are a society for the relief of the destitute sick, and three friendly or benefit societies. There are two coaches daily, the mail and another, to and from Inverness, and a mail-gig to Bonar Bridge.

The council of the burgh consists of a provost, two bailies, a dean of guild, a treasurer, and ten counsellors; in all, fifteen members. The burgh unites with Kirkwall, Wick, Dornoch, Dingwall, and Cromarty in returning a member to parliament.

Cromarty is on the south side of Cromarty Frith, near the entrance, on the peninsula of the Black Isle. The parish is from five to seven miles long, and from two to three broad. The eastern side of the parish is the highest, and it presents to the Moray Frith, by which it is bounded on that side, a range of lofty cliffs, in one part 300 feet high, composed of granitic gneiss, veined with white quartz rock, and lined with blocks of hornblende. Towards the centre and western parts of the parish these primitive rocks are overlaid with sandstones and other secondary formations, the latest being towards the west. East of the town is a large accumulation of peat, with trunks of trees embedded.

The name of Cromarty occurs early: Macbeth was thane of it. The town was peopled by lowlanders, who, from their advanced position, were exposed to frequent hostilities from the neighbouring highland clans, by a combination of which, early in the reign of James IV., it was plundered. It is likely that the admirable position of the town near the entrance of the Frith, which forms a secure and land-locked harbour, had caused it to be selected as a place of settlement by lowland merchants, and that the townsmen had early carried on trade with Flanders and France. After the union of the crowns it declined, but revived after the Revolution by means of the herring fishery. It appears to have again suffered after the Union, but since this depression has again revived.

The town stands on a low alluvial tongue of land jutting out into the Frith. 'It is irregularly built, exhibiting in its more antient streets and lanes that homely Flemish style of architecture characteristic of all our older towns of the north.' (*New Statistical Account.*) There are a plain church, a Gaelic chapel, and a town-house; the last a substantial building with a hall in the upper story and a prison in the lower, and surmounted by a dome or clock-tower. The harbour, formed by a pier, is near the extremity of the point on which the town stands. Vessels of 400 tons can come up to the quay.

The population, in 1831, was 2901, about one-fourth agricultural: the population of the town itself was 2215, that of the country part of the parish 686. There are a hempen-cloth manufactory which employs in all six hundred persons, two hundred of them in the factory itself, and a brewery. A considerable trade is carried on with England in salt provisions; and in 1831, about fifty men were engaged in the herring or white fishery. There are a branch bank and a post-office. Communication is maintained by an omnibus with Inverness, and by steam-boats with Leith and London. Some ship-building is carried on. There are a market on Friday and one yearly fair.

Cromarty was antiently a royal burgh, but was disfranchised at the request of the burghers, A.D. 1672, and was accounted only a burgh of barony. Its privileges as a royal burgh have been restored by the Scotch Burgh Reform Act, but the magistrates can effect little from the want of funds; the antient property of the burgh having been alienated before its disfranchisement. It unites with Kirkwall, Wick, Dornoch, Tain, and Dingwall to return a member to parliament.

Dingwall is at the south-western extremity of Cromarty Frith, 23 miles from Inverness by a circuitous road, and 178 miles (according to Chambers's *Gazetteer of Scotland*) from Edinburgh. The parish comprehends an area of above ten square miles, three-fifths of it moorland or upland pasture, and the remainder cultivated. Dingwall was probably a Danish settlement: it was erected into a royal burgh by Alexander II., A.D. 1227, and, by pavements and other traces of buildings which have been found, appears to have been more extensive than it is now. It was the principal residence of the powerful earls of Ross, and appears to have declined after the extinction of that earldom. Some traces of the antient castle of these earls, comprehending the earthworks and a small portion of the massive walls, may be seen on the north-east side of the town. In the early part of the last century Dingwall was in a deplorable condition from poverty and neglect, and the public tranquillity was repeatedly broken by the frays of hostile clans. Subsequently to the suppression of the rebellion of 1745 great improvements took place, and the town has especially improved of late years. It consists at present of one main street running east and west, and one or two smaller ones branching from it; the streets are paved, but either not lighted or very imperfectly so; and the police is too imperfect to enforce cleanliness, so that even in the main street dunghills are sometimes seen in the front of the houses. Cleanliness is however gaining ground, and there are some good houses and shops. The kirk is a neat and commodious building, just out of the town: near it is a pyramidal obelisk fifty-seven feet high and six feet square at the base, erected on a large artificial mound, by a former earl of Cromarty, to mark out the burial-place of himself and his family: the town-house, a curious old building with spire and clock, is near the centre of the town; and there is a small and wretched gaol and an episcopal chapel.

The population of the parish, in 1831, was 2139: about one-fifth agricultural. There are good roads, and a short canal from the frith enables vessels with coals and other merchandise to come quite up to the town. There is a coach communication daily with Inverness, and steam-boats weekly from Edinburgh, and every second week from London, touch at Invergordon, distant fourteen miles. There are a weekly market (on Friday) and three yearly fairs.

The burgh council consists of fifteen members, including a provost, two bailies, a dean of guild, and a treasurer; the burgh unites with Kirkwall, Wick, Dornoch, Tain, and Cromarty in returning a member to parliament.

There were, in 1837, a parochial school, an infant-school supported by subscription, and three other daily schools in the parish; also one large Sunday-school.

Fortrose is in the parish of Rosemarkie, and on the shore of Moray Frith, just within the narrow passage by which that frith is contracted opposite Fort George. It was antiently the cathedral town of the bishopric of Ross, and is still sometimes called Canonry or Chanonry of Ross; it was erected into a royal burgh by James II., A.D. 1444, and annexed to the previously existing and adjacent burgh of Rosemarkie. The present burgh consists of the two thus united. Fortrose is a small town, with little manufacture and very little trade; and Rosemarkie is an insignificant fishing-village; the two places are about three-quarters of a mile distant from each other. There are some remains of the antient cathedral at Fortrose, compr
or chapel which was an appendage to the main p
church; an antient building, probably a vestry,
arched vault beneath; some tombs in niches in t
with effigies of the bishops, carved in stone, and i
faced; and an antient bell, now hung in a spire o
erection. There are an episcopal chapel and a pri
parish church is at Rosemarkie. For a long period
employment of the poor of Fortrose has been shoe
of Rosemarkie, weaving: the inhabitants are e
in fishing. There is a ropewalk at Rosemarkie, and
at Fortrose. There is communication with Fort G
a ferry; and with Aberdeen, Dundee, Leith, and
by trading vessels.

The population of Rosemarkie parish, in 1831, v
The burgh council consists of a provost, three
dean of guild, a treasurer, and nine other m
fifteen in all. The burgh unites with Invernes
and Forres to return a member to parliament.

Stornoway, the only town in the isle of Lewis, is
at the head of a bay on the east side of the isla
parish is extensive, extending sixteen miles in one
and ten in another; with a population, in 1831, o
whom three-fifths were in the town or its immediate
Stornoway consists of several streets. The hou
general good, with slate roofs, and many not only
even elegantly furnished. There is a handsome k
in 1794, and lately repaired; there are a neat custo
a town-house, and an assembly-room. The house
country parts of the parish are in general miserabl
de-cribably filthy habitations. The principal em
of the inhabitants of the parish is fishing. 'The
divided between fishing, farming, and kelping, a
families have a share of a boat and a lot of land
Statist. Account of Scotland.) Cod and ling ar
and cured, and shipped for Ireland or the manu
district round Glasgow. Haddocks are caught a
for home consumption; and flounders, hakes, sol
and conger-eels, and occasionally whales, grampu
porpoises, are taken.

Stornoway was founded by James VI. of Scotl
I. of England, for the purpose of introducing ci
into the Highlands. The harbour is good and m
quented. Sixty-seven vessels, with an aggregate to
3059 tons, and fifteen hundred boats, belong to the po
district. There are a corn-mill, a saw-mill, and a w
ing mill, a ropewalk, and a large distillery. Kelp-ma
the manufacture of coarse pottery are carried on.
a well-frequented yearly fair for cattle. Sheriff
missary courts, bailie, excise, and justice of peace co
held regularly. There are thirteen schools in th
viz. the parochial school, seven supported by the c
societies or individuals, two 'supported by the
people,' and three without any extraneous support
are a circulating library and two friendly societies.

*Divisions for Ecclesiastical and Legal Purposes
of Crime, and Education.*—The thirty-three
in the two counties are comprehended in the fi
byteries of Tain, Dingwall, Chanonry (*i.e.* F
Lochcarron, and Lewis. The presbytery of Tain
hends nine parishes, in or adjacent to the peninsula
Ross; that of Dingwall, seven parishes in and rou
wall; that of Chanonry, six parishes, in the peni
the Black Isle; that of Lochcarron, seven parishe
west coast (beside the parish of Glenelg, in Invernes
and that of Lewis, four parishes, in the island of Le
presbyteries of Tain, Dingwall, and Chanonry ar
synod of Ross; those of Lochcarron and Lewis, in t
of Glenelg.

Sheriff courts are held at Tain and Dingwall, in t
land of Ross-shire; in Stornoway, in Lewis; and
marty in Cromartyshire. The two counties are u
sheriff. There are four prisons, viz. Tain, I
rose, and Cromarty; they are all bad. Crime is
quent in the two counties, and has diminished cons
within the last seventy or eighty years. Highway
and cattle-stealing, which were common for so
after the rebellion of 1745, have entirely disa
and violent assaults and child-murder, which conti
be common till a much later period, have beco
Sheep-stealing still goes on; but the most common
are minor assaults, committed under the influence
key, and petty thefts. The diminution of crime is

oved condition of the people, the spread of edu-
the more efficient administration of justice. The
ıs offences are usually committed by hawkers,
l other vagrants. The police, though improved,
icient; and there is still a good deal of pauperism
:ity. (*Inspectors of Prisons' Second and Fourth*
ı36 and 1838; see *Parl. Papers* for 1837, vol.
. 1839, xxii.)

re and Cromartyshire unite to return one mem-
liament. The number of voters registered in
ıs 594; in 1835-6, 621. Dingwall, Tain, and
unite with Kirkwall, Wick, and Dornoch to re-
nber; the number of electors registered for the
1834-5, was 571. Fortrose unites with Inver-
:s, and Nairn; the number of registered voters,
was 699, exclusive of those for Nairn, of whom
ıad been received. (*Parliamentary Papers* for
:lix.)

ɔn has been greatly extended and improved of
In 1833-4 there were thirty-three parochial
ith as many teachers, and one hundred and
r schools not parochial, with one hundred and
teachers; total, one hundred and fifty-seven
ıd one hundred and sixty-two teachers. The
ıumber of scholars in these schools dur-
ear was 5118 boys and 2880 girls, together
ren; the least number, 1958 boys and 1043 girls,
001 children. The number of children under
o could read or were learning to do so was 9718;
:r who could write or were learning to do so, 3021.
ɔers, 1837, vol. xlvii.) The schools established
last few years, by the General Assembly, are in
reported as working well. In these schools the
system of teaching introduced among the poorer
Mr. Wood, of Edinburgh, is, it is said, generally
so that the children, instead of being stuffed with
of crude, indigestible matter, as heretofore, are
o analyze and clearly understand all they are
Small libraries too are often appended to these
Tain appears to be distinguished for the increased
paid to education. In addition to the regular
school, a public academy has been opened during
w years, in which an education of a superior kind
A great many of the adult population are unable
sily, or indeed to read in any way. On the western
ıe county it is difficult to find a person forty
(of course, excepting the richer classes) who is
... Under these circumstances it is not surpris-
ıere is in fact but little reading among the people
, although the taste is on the increase. The only
r the labouring classes is a small one at Loch-
orted partly by the subscriptions of the members
by donations. (*Second Report of the Inspectors*
ɪ.)

and Antiquities.—At the earliest historical period
:ry appears to have been inhabited—the western
the Creones, the eastern part by the Cantæ
and the centre by the Caledonii (Καληδόνιοι) of
but it is impossible to assign the limits of their
territories. The Bay Volsas (Οὐολσας κόλπος) of
geographer may be identified with Loch Broom.
ıry (εἴσχυσις) of Varar (Οὐάραρ), or Varase, as it is
:ditions of Ptolemy, which is mentioned also by
f Cirencester, was probably the Moray Frith. The
n Imperii Romani of Richard may perhaps be fixed
s or promontory of Tarbet, and the Abona æstuary
ıe writer may be identified with Dornoch Frith.

early period Ross-shire contains several remains.
rdine and Fearn parishes are some Druidical
nd on the eastern shore of Loch Roig, in Lewis,
ry entire remains of a Druidical circle, the stones
some of them very large, stand on end, at a dis-
ve or six yards from each other, and are in a rough
'hen taken from the shore. There are cairns in
places on the summits of hills. The Druidical
the circles is disputed by Dr. M'Culloch ('High-
. of Scotland,' vol. iii., p. 229, seq.). To the long
darkness which extends over this part of the
er the departure of the Romans, may be assigned
or dounes, or Picts' houses, as they are termed,
suppose to be Danish forts, though some ascribe
.. earlier period than that of the Danish ravages.
s, vitrified ruins, stone obelisks, on or near the
eastern coast, and the traces of habitations in the caves of the western coast, belong to early but unascertained periods.

At a subsequent period Ross became an earldom, which was united with the lordship of the isles (*i.e.* the Western Isles) by the marriage of Donald M'Donald, the lord of the isles, with the daughter of the earl of Ross. These honours were held, about the middle of the fifteenth century, by Earl John, who allied himself with Edward IV. of England (A.D. 1461), rebelled against the government of Scotland during the minority of the king James III., and proclaimed himself king of Ross and the Hebrides. He was supported by Donald Balloch, lord of Isla, and by the earl of Douglas, now in banishment. The rebellion was attended by the most dreadful atrocities; but Ross was assassinated in the course of it, in the castle of Inverness, and the rebellion came to an end without its chiefs having attained their object.

The succeeding earl appears to have inherited the turbulence of Earl John. He was involved in hostilities with the earl of Huntley, another powerful Highland chieftain, and, adhering to his predecessor's English alliance, rebelled against James III. But the extent of the king's preparations induced him to submit to the royal clemency (A.D. 1476). He was deprived of the earldom of Ross, the lands of Knapdale and Kintyre [ARGYLE, vol. ii., p. 313], and the hereditary shrievalty of Inverness and Nairn, which were all annexed to the crown. He was in return created a peer of parliament with the title of John de Isla, lord of the isles. During this period Ross gave title to a bishopric, erected by David I., king of Scotland; the cathedral was at Fortrose.

There are several remains of antient castles in Ross-shire. Lochlin Castle is on an eminence six miles east of Tain; it consists of two square towers sixty feet high, united at one corner of each, with a staircase at the point of junction, and large turrets raised upon the towers. Craighouse Castle, on the southern shore of Cromarty Frith, is an antient tower of five stories; the castles of Killcoy and Redcastle are on the shore of Moray Frith, or rather of Loch Beauley. There are some ruins of Cadbole Castle on the east coast, between Cromarty and Moray friths, and of Donan Castle, on the shore of Loch Alsh, on the west coast. There are also some ecclesiastical ruins. Lochlin Abbey (or Fearn Abbey) is near the castle of that name, east of Tain; and there are the ruins of a number of antient chapels in Lewis, especially of St. Mulvay's chapel, in the north part of the island.

In 1649 the M'Kenzies of Ross broke out into rebellion, to revenge the execution of Charles I., but were defeated. The last battle fought by the gallant Marquis of Montrose was in this county, at Craigchenichan (*i.e.* the rock of lamentation), in Kincardine parish, just on the northern border of the county, where he was defeated by Colonel Strachan; he swam over the Kyle into Sutherlandshire, was apprehended in Assynt, in that county, and afterwards executed at Edinburgh (A.D. 1650). The earl of Seaforth having forfeited his estates, which lay in the west side of the county, by his share in the rebellion of 1715, and the military not being able to penetrate into so inaccessible a district and levy the rents for the crown, the faithful clansmen regularly paid theirs to an agent, who transmitted them to the earl, then in exile. In 1718, Donan Castle was seized by the earl of Seaforth and one or two other Jacobite noblemen, who arrived on the coast in two Spanish frigates, with a small body of Spanish troops; a few Highlanders took arms and joined them, but they were defeated in Glenshiel by the government troops, and the leaders compelled to make their escape. 'Rob Roy' was engaged among the insurgents in this conflict.

(*New Statistical Account of Scotland;* Playfair's *Description of Scotland;* Forsyth's *Beauties of Scotland;* Chambers's *Gazetteer of Scotland;* Tytler's and Scott's *Histories of Scotland; Parliamentary Papers.*)

ROSS. [HEREFORDSHIRE.]

ROSTELLA'RIA. [STROMBIDÆ.]

ROSTELLUM, a botanical term applied occasionally to very different parts: 1, it is most frequently used as a diminutive of rostrum, to express any small beak-shaped process; 2, it is applied to the short beak-shaped process found on the stigma of many violets, as *Viola hirta, V. odorata,* and *V. canina,* &c.; and Orchidaceæ, as *Orchis, Spiranthes, Listera,* &c.; 3, some writers have also used this term to indicate the radicle or descending element of the embryo of the seed.

ROSTOCK, the largest town in the grand-duchy of Mecklenburg-Schwerin, is situated in 54° 5′ N. lat. and 12° 20′ E. long. It stands on an eminence, in a flat and very fertile country, on the bank of the river Warnow, which is there 2400 feet broad, and forms the harbour. The Warnow falls into the Baltic at Warnemunde, nine miles below the town.

Rostock consists of three parts, the old, the middle, and the new town, besides the suburbs, and it is surrounded with antient fortifications. A great part of the city is built in the old fashion of the free German cities, with the gable ends toward the street, but it has been very much improved within the last twenty-five years by the erection of many large and elegant houses. Most of the streets are straight and pretty broad, and well paved. On the whole the old town is the most irregular, the middle town the handsomest, and the new town the most regularly built. The principal public buildings are the grand-ducal palace, more remarkable however for its extent and its admirable situation than for the style of its architecture; the university, a very extensive building; the court of justice, and the town-hall, both modern edifices; the theatre, and the churches of St. Mary and St. Peter. The church of St. Mary is 300 feet long, 240 broad, and 96 feet high up to the cupola. It has one of the finest organs in Northern Germany. This church contains the tomb of Grotius. St. Peter's church, which was founded at the end of the twelfth century, is chiefly remarkable for its fine steeple, which, with the very lofty conical spire, is 420 feet in height. The university was founded in 1419. It has 23 professors, but only about 110 students. The library consists of above 80,000 volumes, including many very rare and valuable works, and has been much increased by the collection of Professor Tychsen, especially in Oriental and Spanish literature; likewise a cabinet of medals, a museum of natural history, a botanical garden, and an anatomical theatre. There are also a theological seminary, a Bible Society, and other useful institutions. The number of inhabitants is 18,200.

Rostock was a town of the Wends, or Vandals; it was taken in 1161, by Waldemar, king of Denmark, and burnt, with its celebrated idol. In 1323 it was annexed to Mecklenburg, joined the Hanseatic League in 1630, and was for a long time the next city in rank in the Baltic after Lübeck. Great privileges were granted it by the dukes of Mecklenburg, many of which it still retains, such as the right of choosing its own magistrates, the right of taxing itself, of coining money, the jurisdiction over all its inhabitants, and their estates in the country. Though its commerce is not so considerable as in the time of the Hansa, it is still the principal trading port of Mecklenburg: it has about 150 ships, which sail under its own flag, and the number of ships that arrive every year is about 600, the foreign vessels being mostly English, Russian, Swedish, and Danish. The exports are chiefly corn and wool. The imports are colonial produce, wine, and bay salt. There are manufactures of canvas, linen, baize, ships' anchors, soap and vinegar, and some breweries, distilleries, and sugar refineries.

(Cannabich, *Handbuch*; Stein's *Lexicon*; Stein's *Handbuch*, by Hörschelmann; Hempel's *Mecklenburg*.)

ROSTOU. [Yaraslow.]

ROSTRUM, or, more properly, **ROSTRA**, was a platform or elevated space of ground in the Roman forum, from which the orators used to address the people, and which derived its name from the circumstance that after the conquest of Latium the beaks (rostra) of the Antiatian ships were affixed to the front of it. (Liv., viii. 14.) The rostra was between the Comitium, or place of assembly for the Curiæ, and the Forum, properly so called, or place of assembly for the Comitia Tributa. Bunsen, in his work on the Roman Forum, quoted by Arnold (*History of Rome*, vol. ii., p. 165), judging from the views of the rostra given on two coins in his possession, supposes that it was a circular building, raised on arches, with a stand or platform on the top, bordered by a parapet, the access to it being by two flights of steps, one on each side. It pointed towards the Comitium, and the rostra were affixed to the front of it, just under the arches. Its form has been, in all the main points, preserved in the ambones, or circular pulpits, of the most antient churches, which also had two flights of steps leading up to them, one on the east side, by which the preacher ascended, and another on the west side, for his descent. Specimens of these old pulpits are still to be seen at Rome, in the churches of S. Clement and S. Lorenzo fuori le Mure. The orators appear to have walked up and down the rostra in addressing the people, and did not, like modern speakers, remain standing in one spot. Down to the time of Caius Gracchus even the tribunes in speaking used to front the Comitium; but he turned his back to it, and spoke with his face towards the Forum. (Niebuhr, *History of Rome*, vol. i., note 990; vol. iii., note 268.)

ROSTRUM, a botanical term applied to any rigid prolongation of remarkable length, or to any additional process at the end of any of the parts of a plant. Under this term are included most processes and long points of an irregular character, as the thin apices upon the operculum of the sporangium of many mosses, the lengthened tube of the calyx upon the achenia of Scabiosa, Tragopogon, Lactuca, and many other Compositæ, also of Scandix and Anthriscus, the remaining and often enlarged style upon many fruits, as of Brassica, Sinapris, Saxifraga, and many other prolonged points, as those upon the utriculate indusia of Careæ flava and C. ampullacea. The term *cornu* is often applied to parts similar to rostrum.

ROT, DRY. [Dry-Rot.]

ROTA'LIA. [Foraminifera, vol. x., p. 348.]

ROTATE, a botanical term applied to either the calyx or corolla, when the tube is very small or entirely wanting, and the petals or sepals are united and spreading. Examples are seen in the genera Anagallis, Lysimachia, Borago, Solanum, Verbascum, Galium, and Rubia.

ROTATION (*Rota*, a wheel). The popular conception of a body in rotation is vague, except only in the case in which the rotation is made about an immoveable axis. This subject has accordingly been usually treated by mathematical methods; and mathematicians, content with their results, and with their power of interpreting them, did nothing towards the improvement of the manner of presenting the elementary view of rotation. Within the last seven years however, a French philosopher of a truly remarkable genius for simplifying the elements of mechanics, M. Poinsot,* has presented the subject in a point of view which would excite wonder that ideas so simple should never have occurred to any one before, if it had not been so often seen that simplicity is not a fruit of the first growth. In this article it is to be remembered that we confine ourselves to notions connected with motion, independently of its producing force, reserving the latter for Theory of Couples: an arrangement dictated rather by our desire to keep in one article what may be accessible to the general reader, than by its own intrinsic propriety. For the mathematical part of the subject, so far as we enter into it, see Virtual Velocities.

There is this parallel between the conception we form of the simple motion of a point and that of a solid body, namely, that each has a case of peculiar simplicity, by which others are rendered more easy to describe. A point may move in a straight line, or may preserve its direction unaltered; a body may revolve round a fixed axis, or each point may preserve its circle of revolution unaltered. But, owing to the comparative simplicity of the motion of a point, it is easy [Direction] to carry with us, when it moves in a curve, the idea of its still having a different direction at every point of the motion, namely, that of the tangent of the curve. It is not so easy to see that whenever a body moves about a fixed point, no matter how irregularly, there is always, at every instant of the motion, some one axis which is, for that instant, at rest. This notion of an instantaneous axis of repose, not continuing to be such for any finite time—answering to that of an instantaneous direction in curvilinear motion, which does not continue for any finite time to represent the direction—must be first distinctly formed, before any satisfactory account of the rotation of a body can be given.

Let us suppose a uniform sphere, with a fixed centre, but otherwise free to move in any way. Let a succession of forces act upon it, gradual or not, in such a manner that it will never move round one axis for any finite time during the continuance of their action. At a certain moment, let all the forces cease entirely, leaving the sphere to itself. It is easy enough to see that from and after the moment of discontinuance, the sphere will move round an axis which remains unaltered; or, if this be not perfectly perceptible, the geometrical considerations presently to be given, will

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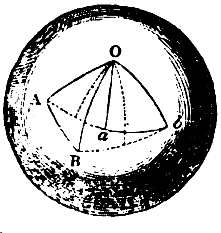
* In a Memoir read to the Academy of Sciences, May 19, 1834, of which only an extract, explaining general considerations and results, has been published, Paris, Bachelier, 1834.

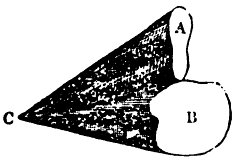
o. There must then, at the very moment of dis-
ıce of the forces, have been an axis which was for
ıent at rest, namely, the axis on which the motion
inue after the forces cease. In this way, knowing
ilinear motion would become rectilinear the mo-
t the constraining forces are removed, we might
idea, if we had not one otherwise, of the tangent
, the line of direction for the time being, and which
ıtinue to be the line of direction if the forces were

t the sphere, the centre being fixed, have moved
one position (P) into any other (Q), but not round
If a point were to move from A to B, however
r the intermediate path might be, it *might* have
ɔm A to B in a straight line, the chord of the curve.
, it may be shown that however *unaxical* the
n which the sphere moves from position (P) to
Q), it might have been changed from the one to
by a motion of simple revolution. To show this,
that, the centre being fixed, the positions of any
s of the sphere, not opposite, give the position of
e, so that, if any two such points chosen in the
P) can be transferred to their places in (Q) by a
volution of the sphere round an axis, the whole
transferred by that same revolution. Suppose



ın arc in the position (P), comes to *ab* in the position
ct A*a* and B*b*, and let great circles drawn through
of bisection meet in O. Then it is easily proved
= O*a*, OB = O*b*, whence AOB, *a*O*b*, are triangles
sides of one severally equal to those of the other.
e angles AOB, *a*O*b*, are equal, whence the angles
BO*b* are also equal. If then the sphere should
ound an axis passing through O and the centre, A
brought to *a* at the same moment at which B is
to *b*; whence the change from (P) to (Q) can be
ıs asserted, by a simple axical revolution.
we suppose *ab* ever so near to AB in position, the
ng is still possible, and by placing *ab* infinitely
B, or finding the limit of the point O during a
the sphere which is diminished ad infinitum, the
f the instantaneous axis of repose may be deter-
any point of the motion of the sphere. And if we
his sphere to be merely cut for convenience out of
body, with the fixed point of that body for its
e instantaneous axis of repose of the body may be
ng always that of the sphere.

M. Poinsot's remarkable propositions is the follow-
y motion of a system round a fixed point may be
y cutting a cone (in the most general sense of the
of the body, with the fixed point for a vertex, and
space another cone for it to roll upon, also with the
t for a vertex.
f in the adjoining diagram, the cone A be made
on the cone B, both being supposed destitute of
bility, so that the contact of the curves of A and

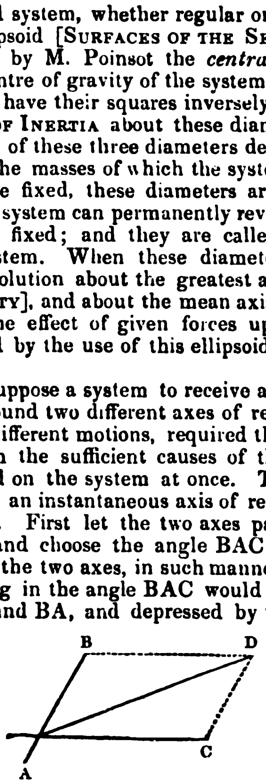


ays be made, and if the system out of which A is
en restored (also without impenetrability), there
complete geometrical representation of one pos-
on of the system about C. Moreover, there is no
notion which might not be represented in the
ner by properly choosing the cones A and B, and
f repose for the instant is the line in which the
touch.

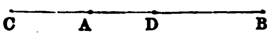
If we suppose no fixed point in the system, so that motion of translation, as well as of rotation, is possible, M. Poinsot has given another equally distinct notion of the state of the motion during an infinitely small time. The most simple notion which we can form of a combined translation and rotation is the screw-like motion, in which a uniform motion of translation is accompanied by a uniform motion of rotation round a line parallel to the motion of translation. M. Poinsot has shown that every motion of a system must be, at any one instant, either a simple motion of translation, or one of rotation, or the screw-like motion above described. That is to say, at every point of time in the motion of a system there exists a line (whether internal or external to the *material* system matters not, as long as they are immoveably connected) along which the system is at that instant dropping, while all the rest of the motion at that instant is simple rotation about that *slipping axis*. There will perhaps be some difficulty in the first reception of these ideas; but when they are once understood, the precision they will give to the conception formed of the motion of a system will be found highly valuable.

In every solid system, whether regular or not, can be described an ellipsoid [Surfaces of the Second Degree] which is called by M. Poinsot the *central* ellipsoid. Its centre is the centre of gravity of the system; its three principal diameters have their squares inversely proportional to the Moments of Inertia about these diameters as axes; and the position of these three diameters depends upon the distribution of the masses of which the system is composed. If the centre be fixed, these diameters are the only axes upon which the system can permanently revolve without the axis being also fixed; and they are called the principal axes of the system. When these diameters all differ in length, the revolution about the greatest and least axis is stable [Stability], and about the mean axis unstable. The conception of the effect of given forces upon a system is much facilitated by the use of this ellipsoid. [Theory of Couples.]

Let us now suppose a system to receive at the same time two motions, round two different axes of repose: that is to say, given two different motions, required the motion which will result from the sufficient causes of the two motions being impressed on the system at once. There will be at the first instant an instantaneous axis of repose, which it is required to find. First let the two axes pass through the same point A, and choose the angle BAC out of the four angles made by the two axes, in such manner that points of the system lying in the angle BAC would be elevated by the rotation round BA, and depressed by that round CA or *vice versâ*. On the axes take AB and AC, lines proportional to the angular velocities about those axes, complete the parallelogram AD, and draw the diagonal AD. Then AD is the axis of repose at starting (which however it may not continue to be), and AD represents the angular velocity round that axis at starting, in the same manner as AB and AC represent the impressed angular velocities about AB and AC. [Composition.]



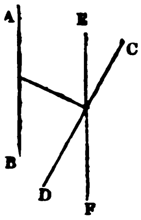
Next let the axes be parallel to one another, say perpendicular to the plane of the paper, passing through A and B. If the rotations are such that A and B would both rise, or both fall, on the paper, each by the rotation about the other, take a point C in AB continued, nearest to the axis about which the angular velocity is greatest (say that of A), and such that CA is to CB as the angular velocity about B to the angular velocity about A. Then the axis of repose at starting is a line passing through C parallel to the former axes, and the angular velocity is the difference of the angular velocities about A and B, and in the direction of the greater. In this case the directions of the rotations about A and B [Direction of Motion] are different. There is one remarkable case, namely, when the rotations about A and B are equal. In this case the rule would lead us to a rotation equal to nothing



made about a point at an infinite distance—one of those extreme conclusions which require interpretation. The fact is that these two rotations give only a simple motion of translation = AB × Angular Velocity per second, and such as to make the system move upwards or downwards on the paper according as the separate rotations would make the points A and B move upwards or downwards. This particular case will be more intelligible when looked at with the help of the THEORY OF COUPLES.

But if the rotations be in the same direction, so that A will be lowered and B raised, or *vice versâ*, each by the rotation about the other:—Take a point D, dividing AB so that AD is to DB as the angular velocity about B is to that about A. Then will the axis of repose at starting be a parallel drawn through D to the axes passing through A and B, and the angular velocity will be the sum of the angular velocities about A and B, its direction being that which lowers A on the paper and raises B, or *vice versâ*, according as is done by the given angular velocities.

Lastly, let the axes be neither parallel nor intersecting, as AB and CD:—Through the point in which CD meets the common perpendicular draw EF parallel to AB, and at the



instant at which the rotations round AB and CD commence, give a couple of equal and contrary rotations about EF, each equal to that about AB. This last pair produces no effect, so that the composition of the four rotations gives the same result as that of the two. Now, as above stated, the rotation round AB, and its equal and contrary round EF, produce nothing but a motion of translation, while the remaining rotation about EF, compounded by the first rule with that about AB, gives what would be an axis of repose, if it were not for that translation. The whole result then is, that the system begins to move about an axis, which axis begins to undergo a translation in space.

There is no work to which we can refer the reader for a simple demonstration of these rules, apart from higher considerations. But the student of mechanics who does not pay attention to the simple phenomena of translation and rotation, will rarely find himself able to attain a complete comprehension of the equations by which these phenomena are applied in physics.

ROTATION OF CROPS. It has been observed in a former article [ARABLE LAND] that a repetition of the same crops in succession has a peculiar effect on the soil, so that if grain of the same nature be sown year after year in the same ground, it will not produce the same return of the seed, even when abundantly manured. The reason of this is not satisfactorily explained, but the experiments which have been made by men of science lead us to conclude that the real cause will be gradually discovered; and considerable advances have been made towards a rational solution of the question. It has been observed that it is the formation of the seed which principally causes the deterioration of the soil; for if the crop be fed off in a green state, or mown before the seed is formed, the same may be safely repeated, and no diminution of the plants is apparent. Thus grasses in a meadow which are mown before the blossom is faded or the seed formed, will spring up again vigorously; but if the seed is allowed to ripen, the roots die away, and the best grasses gradually disappear. It is thus that when a meadow is mown year after year for hay, and the earliest grasses are allowed to ripen their seed, the crop will be later and later, and all the earliest grasses will disappear. Irrigation prevents this, and seems to restore to the land whatever the grasses require for their continuance. Feeding of the meadows does the same; and this leads to the conclusion that water restores the power of production; and that, the grasses not being permitted to run to seed, the deteriorating effect is not produced.

If it had been a mere exhaustion of the nutritious particles in the soil which caused the deterioration of the subsequent crops, some kind of manure might restore the fertility; but this is not the case. However judi
land may be manured, it is not practicable to rai
wheat or clover, or of many other plants, on a soil
shown that, as the farmers say, it is *tired* of that
clover grows well after wheat, and wheat after
that the same effect is not produced in the soil by
crops. Experiments have been made by eminent
particularly by Macaire of Geneva, at the request c
dolle, which lead one to suppose that, in the format
seed or other nutritious parts of plants, the sap i
that it takes up certain elements and deposits oth
are the residue of the process: and these being no
cessary to the formation of the seed, are rejected b
action of the plant, and exude by the roots. Th
inferior animals, which in many respects have so
with vegetables in their growth, as the polypi, take
ment by the same openings or pores by which the e
are voided after digestion; and the different co
different animals enables one class to feed on the
of another; whereas no animal in a healthy state
nourishment from that which it has already dig
voided. Our ignorance of the functions of v
prevents us from foreseeing the effects produce
by the expansion of the blossom or the ripening of
but experience leads us to perceive that cer
thrive best after certain others; and that in this
are always of distinct and different natures. A pl
has fibrous roots, and throws up a seed-stem with f
thrives best after one which has a fleshy root
succulent leaves on a branching stem. Thus, whe
after beans, vetches, or clover; barley and oats
nips, carrots, or potatoes. Independently of th
which may be put into the ground, the crops will
where the proper succession is attended to, th
plants of a similar kind are made to follow each c
ascertain the cause of this, Mr. Macaire and s
scientific men observed the change which took p
water in which wheat had been made to grow. T
a deposit in the water of the nature of a bitter ex
this they concluded to be excrementitious. Whe
experiments were conclusive or not, they found
grew well in the water in which wheat had depo
supposed excrement; and, on the other hand, wh
in the water in which beans had grown. This con
well-known fact that heavy soils of a rich quality
manured will bear alternate crops of wheat a
without the intervention of a fallow for a long serie
as is practised in some parts of Kent. The effect
ing land is explained on the same principle; the
is washed out by the rains, or is decomposed by
and air to which it is exposed by the repeated
Thus the land is said to be *sweetened*, an expre
common among those farmers who adhere to t
ing system.

If the chemical nature of the excrement of e
cultivated could be accurately ascertained, artifi
might be discovered, by which the same effect m
peditiously produced, which now requires a whol
fallowing. But experience and observation ha
pated science, as is often the case; and a judiciou
of crops has been found to prevent the bad effe
change in the constitution of the soil which is cau
growth of particular classes of plants; whether
they deprive it of peculiar salts, as some will have
posit deleterious particles, according to others.
interesting it may be to the curious inquirer to as
real cause, it is sufficient for the practical farmer t
experience what crops succeed best after each
how soon the same kind of seed may again be so
same ground with a reasonable prospect of its pr
good crop; and this after all can only be learned fr
experiment and observation.

In all countries where peculiar attention has bee
agriculture, the most advantageous succession o
generally known; and if any deviation takes place,
exception to the rule, and is not looked upon as a
imitation, but rather as an experiment of a doubtf
Certain general principles are commonly admitted
established; the chief of these is, that a plant wit
stem and farinaceous seed should follow one with
ing stem and a fleshy root, which has been taken
ground by mowing or feeding before the seed was
all these conditions cannot be obtained, that some

at least should be complied with. Wheat sown after clover, which is allowed to be the best succession on light soils, fulfils all the conditions: when it is sown after beans, the condition of the preceding crop not ripening its seed is given up; and consequently this succession is inferior to the other. Potatoes, at first sight, appear to fulfil all the necessary conditions; but although they do not often ripen the seed above ground, the bulbs of the roots contain so much farina, that in the formation of these the soil is notoriously deteriorated; and farmers well know that, except in peculiar cases which form exceptions, wheat never thrives so well after potatoes as it does after clover, even when the ground has been so richly manured as to contain more organic matter in a soluble state than there is in the roots of the clover.

A knowledge of the different plants which may succeed each other on the same land is of great importance in forming a judicious rotation, so as to obtain the most valuable produce from any given soil, in as quick recurrence as possible without the risk of failure. In the triennial system, which could only be profitable where much of the land remained in a state of pasture, two crops of corn were taken in succession after a complete fallow. But even here it was found advisable to have different kinds of grain, and not to repeat the same crop without a fallow intervening. In very rich soils wheat and barley were the usual crops after the fallow; and the manure was obtained by means of cattle or sheep kept on the pastures in summer and on hay and straw in winter. Repeated ploughings were indispensable; and the farmer who stirred his land the most was the most certain of good crops. But when pastures were broken up, this system soon exhausted the soil for want of manure, and it became indispensable to devote some portion of the land to raise food for the animals whose dung is required to keep up the fertility. Hence the introduction of roots and artificial grasses. It was soon observed that the crops of corn were much better on the land which had borne these roots and grasses, even with less manure, than after crops of grain; and a rotation was adopted in which green crops were raised between every two crops of corn. In process of time the fallows were found to be superfluous wherever green crops could be raised with advantage; and the land was kept clean by careful weeding and hoeing. The effect of a judicious rotation on the produce raised in a given time was so evidently advantageous, that it gave rise to a notion that in this alone consisted the whole art of the farmer, even to the neglect of manure; and clauses were introduced in leases prescribing the rotation to be strictly adhered to, often with detriment to the land and loss to the tenant, when the circumstances required a deviation from the rule.

In order to find the crops which may advantageously succeed each other in rotation, many circumstances must be taken into consideration. First of all the quality of the soil, and its fitness for particular crops; next the wants of the farmer and his family, and the maintenance of the stock required to produce a sufficient supply of manure. It is unreasonable to expect poor light land to produce wheat and beans, although by high cultivation these crops may be forced. Rye, oats, and roots may give the farmer a better profit, by being raised at a less expense than more valuable crops, which must be forced with manure, and at best are precarious in soils not adapted to their growth. In moderate loams wheat may recur every fourth or fifth year, whereas in very rich compact loams it may recur every third, and even every alternate year. Clover and many artificial grasses do not succeed well if they recur oftener than every sixth year, or with even a longer interval. Rape, flax, and potatoes require a still more distant recurrence on the same ground. All these considerations lead the farmer to the selection of the most advantageous rotation for soil of his farm; and where the land in a considerable trict is nearly of an uniform quality, experience soon blishes a course which no one finds it prudent to de- from. It happens frequently however that a great ety of soils, very different in their nature and fertility, intermixed; and then, unless the farmer can apply the principles of rotations, he may greatly err by following course, which may be very judicious for the prevailing of the district, but not at all suited to some of his fields. the old advice to a young farmer, to 'look over his bour's hedge,' may not be a prudent one to follow; ven if there were no difference in the nature of the , or in the state of fertility in which it is at the moment, a blind adherence to the practice of others will never lead to any improvement: for such improvement can only be effected by some knowledge of the reasons on which any practice is founded. Hence a knowledge of the crops suited to any particular soil, and the order in which these crops should succeed each other, is indispensable to the advantageous cultivation of a farm.

That which forms the food of man is always the principal object in the cultivation; and, excepting rice, which only grows in warm climates, there is no food more universally used than that which is made from wheat. Rye, barley, oats, and pulse are only substitutes where wheat cannot be raised in sufficient quantities. Next to grain comes meat, chiefly beef, mutton, and pork, of which the consumption increases with the wealth of a nation and the advance of its agriculture. Wheat and fat cattle are therefore primary objects with every good farmer; and he who can raise most wheat and fatten most oxen or sheep or pigs will realise the greatest profit.

Many circumstances may indicate a deviation from the course which, as a general rule, is most advantageous. The facility of purchasing manure from neighbouring towns may allow of more frequent crops of corn, and of nutritious roots which require much manure, such as potatoes, and which give no return to the land in the shape of dung. But we must lay down rules for those who are to rely on their own resources to recruit the land with manure, so that it may give the greatest produce without diminishing in fertility; and this can only be done by a judicious feeding of live-stock.

The simple rotation of wheat and beans alternately would be by far the most profitable in rich clay soil, as both these crops always obtain a good price in the market; but if a whole farm were so cropped, nearly all the manure must be purchased; for, after a few crops, the wheat-straw and bean halm would not produce half the manure required for the land. Hay and oats must be purchased for the horses required for the tillage, which might not be procured so readily or so cheap as they may be raised on the farm. On very light sands wheat or beans cannot be raised, except by a very expensive mode of cultivation; but rye, oats, peas, buckwheat, and roots for cattle must be substituted. On chalky loams the principal crops are barley and artificial grasses for sheep. In short, no particular rotation can be prescribed without a complete knowledge of the soil, the locality, and every circumstance connected with any particular farm. As the most universal rule, it may be laid down that every alternate crop should be consumed by animals on the farm, and that, as much as possible, the plants which succeed each other should be of different natural botanic families. Experience has generally shown the time that should be allowed to intervene between the recurrence of the same kind of crop, and we have only to form our plans accordingly.

In order to prove that the principles we have here laid down are not formed on mere theory, we have only to show that experience and observation have led to the same practical results, and that those rotations which have stood the test of the longest experience have been gradually brought to a considerable perfection in consequence of the failures which generally followed any great deviation from the true rational course.

Of the old triennial course (fallow, wheat, barley or oats) it must be observed that the two corn-crops so rapidly deteriorate the soil, that a complete year of fallow is required to purify it, and a good manuring to keep the land in heart, and that all the industry of the farmer cannot keep up the fertility of the land without extraneous help, either from the manure made in towns, or in the farm-yard by cattle bred and kept in commons or pasture-grounds. This system, which prevailed so long, cannot be called a rotation; and no real improvement was introduced into agriculture until the notion of its perfection was exploded, and tenants were permitted to deviate from it. The rotations adopted in the place of this old system necessarily partook at first of its main defects. Green crops were introduced of necessity to supply the loss of the commons and pastures, which, as the population increased, were gradually cultivated as arable land: but the two white crops remained in succession, and even now, such is the force of habit and early impression, that one of the most difficult points to be gained with mere practical farmers is to make them have patience when their land is in a good state, and to prevent their sowing a white crop, which is immediately profitable and obtained at little or no expense, instead of a green crop, which will keep the land in heart and improve it for future crops, but which does not figure in the account of sales. Yet it can be clearly shown, that in most cases the second corn-crop is dearly purchased by the expense required to restore the land to the state in which it was when the seed was sown a second time; manure alone will not do this; fallowing and repeated ploughing can alone effect it: and whether you plough several times before a crop, or are forced to do so after it, there is no difference in the expense of labour, although there may be much in the value of the subsequent crops.

The Norfolk course (turnips, barley, clover, wheat), which is so well known and deservedly in repute for light sands, has only one defect, which is the too frequent recurrence of clover. Rye grass, the usual substitute in sandy soils, unless it be fed off young, is far inferior to clover as a preparation for wheat, and this accords with the theory; for wheat and rye grass are both of the natural family of the *gramineæ*. Tares or vetches are a good substitute in heavy soils, as well as beans, both of which are *leguminosæ*, but not well suited to light sandy soils. Peas are sometimes introduced; but they are apt to encourage weeds, unless the crop be very heavy, and then they exhaust the soil, and leave little vegetable matter behind them in their roots.

In many countries there are other vegetable products, which are required for the food of the inhabitants, or supply the raw materials of manufactures: these must be introduced into the rotations, according to their effect on the soil and the cultivation they require. Indian corn, or maize, and French beans, for their seed, are cultivated in more southern climates as field crops. Potatoes are now an essential product in some districts, and one which, after maize, produces the greatest quantity of food for man from a given portion of land. But potatoes require much manure, and cannot profitably be cultivated to a very great extent as a farm produce, nor repeated on the same land, for any length of time, oftener than once in eight or ten years; they should however always enter into the rotation in that portion of the land which is to be much worked, cleaned, and manured after a crop of corn. Flax, colsa, hemp, and many other plants are cultivated in various districts. By a little management a great variety of produce may be introduced with some regularity; and, as a specimen, we will give a rotation which is generally adopted in the neighbourhood of Lille in France, and was noticed in the 'Journal of the Royal Agricultural Society of England,' vol. i., part iii., page 292.

The quantity of land is 15 *bonniers* (about 60 imperial acres). Each bonnier is divided into 16 cents; each cent is consequently one-fourth of an acre.

Rotation of Crops for Four Years.

First Year.			Second Year.			Third Year.			Fourth Year.			
Bon.	Cent.		Bon.	Cent.		Bon.	Cent.		Bon.	Cent.		
0	12	Colsa plants	1	8	Oats	1	0	Clover				
0	6	Turnips				0	8	Flax				
0	6	Cow-cabbage										
			1	0	Tares							
			0	8	Rye							
			0	8	Winter barley	2	8	Colsa	4	8	Wheat	
			0	8	Clover							
			0	4	Potatoes							
4	8	Wheat	0	2	Beet-root	0	8	Beans				
			0	2	Carrots							
			0	12	Colsa plants							
			0	6	Turnips	1	8	Oats	1	0	Clover	
			0	6	Cow-cabbage				0	8	Flax	
1	0	Clover										
0	8	Flax							2	8	Colsa	Wheat
2	8	Colsa	4	8	Wheat	4	8	Tares, &c. (as in the second year)	0	8	Beans	
0	8	Beans							1	8	Oats	
			1	0	Clover							
1	8	Oats	0	8	Flax							
1	0	Rye and tares										
0	8	Rye	2	8	Colsa							
0	8	Winter barley				4	8	Wheat	4	8	Tares, &c. (as in second and third years)	
0	8	Clover										
0	4	Potatoes										
0	2	Beet-root	0	8	Beans							
0	2	Carrots										
15	0		15	0		15	0		15	0		

The tares, rye, winter barley, and clover are mostly cut green for fodder.

In this rotation there are a great many different crops, but the chief is wheat, which occupies 18 acres in 60, and thus recurs nearly every third year on the same ground. It invariably follows clover, flax, colsa, and beans, all plants of different families from the *gramineæ*. After the wheat, various green crops follow, and, excepting a very small portion of winter barley and rye, which are generally cut green for the cattle, all these are likewise of different families from wheat. Then come colsa, beans, and oats, all but the last of different families from the two preceding; and it must be observed that the colsa plants raised to be transplanted are followed by beans, and the turnips and cow-cabbage by oats, while the colsa for seed comes after tares, rye, winter barley, and clover. This rotation is not a theoretical one, but actually and strictly adhered to by all those who are considered good farmers in the district where it has been the rule for a century and more. It is not the result of physiological theories, but it is most probably the parent of the theory which is now almost universally adopted by all scientific agriculturists.

Mr. Blackie, who may be considered as very good authority in modern British farming, was requested, when in [illegible] to recommend a course of cropping or a rotation suit[illegible] the northern portion of France. Probably without knowledge of what was actually the practice in a part [illegible] he composed a table of crops, which he considered as [illegible] to a very rich soil in a very genial climate; and if we [illegible] pare this with the foregoing rotation, we shall be su[illegible] to find how nearly they agree in principle. It [illegible] published in the 'Gardeners' Magazine,' vol. ii., [illegible] lished in a paper by Mr. Towers in the second part of [illegible] i. of the 'Journal of the Roy. Agr. Soc. of England.' as it is an interesting agricultural document, we in[illegible] in the following page.

It will be remarked in perusing this rotation, that the true principles are strictly adhered to:—wheat follows clover, vetches, beans, and potatoes; and after the wheat we have roots and green crops. The only remark which strikes a practical farmer is that ten acres of wheat are succeeded by potatoes, and these by wheat again. There is very little land in Great Britain which will bear so severe cropping, without much more manure than a farm of 1[illegible]

Mr. Thomas Blackie's scheme of Rotation upon a Farm of 100 *Acres, as proposed to the French government.*

First Year. Acres.	Second Year. Acres.	Third Year. Acres.	Fourth Year. Acres.	Fifth Year. Acres.	Sixth Year. Acres.	Seventh Year. Acres.
	5 turnips	10 oats			10 potatoes	
	5 cabbages				3 vetches	
	2½ field beet	5 barley	15 clover	15 wheat	2 beans	
30 wheat	2½ carrots					
	10 potatoes		5 turnips			30 wheat
	3 vetches		5 cabbages	10 oats		
	2 beans	15 wheat	2½ beet		15 clover	
			2½ carrot	5 barley		
		10 potatoes		5 turnips		
15 clover	15 wheat	3 vetches		5 cabbages	10 oats	
		2 beans		2½ beet		15 clover
5 turnips	10 oats		30 wheat	2½ carrot	5 barley	
5 cabbages		15 clover		10 potatoes		
2½ beet	5 barley			3 vetches	15 wheat	
2½ carrots				2 beans		
			10 potatoes		5 turnips	10 oats
10 oats	15 clover	15 wheat	3 vetches	15 wheat	5 cabbages	
5 barley			2 beans		2½ beet	
					2½ carrots	5 barley
10 potatoes		5 turnips	10 oats			5 turnips
3 vetches	15 wheat	5 cabbages		15 clover	15 wheat	5 cabbages
2 beans		2½ beet	5 barley			2½ beet
		2½ carrot				2½ carrots
10 lucern	10 lucern	10 lucern	10 lucern	10 lucern	10 lucern	10 lucern*

*(To be ploughed up after seven years, and followed by wheat.)

eres can afford for a tenth part of it · but this is very ily modified by substituting a green crop for a portion perhaps one-half) of the potatoes, and letting the potatoes be ucceeded by barley or oats instead of wheat. The rotation ill then be less scourging, and better adapted to land of te fertility, where extraneous manure cannot be ed upon. We give it as an example of the applica- of the true theory of rotations, and it is remarkable w nearly it accords with that which was the result of ractice alone without theory. We have ourselves for y years adopted a rotation without being tied down to positive rule, which has been suggested by circum- ces, and in some measure regulated by our conviction of e truth of the theory we have attempted to elucidate. In clayey loam on an impervious subsoil, but mostly com- ely drained, we have had turnips and Swedes on high ges, tares, mangel-wurzel, potatoes, and a portion of e to cut up green; succeeded by barley and oats sown ith clover, rye-grass, and other biennial grass seeds. hese were mown for hay the first year, and sometimes the cond also, but generally depastured one year at least; followed beans, and after these wheat. The green ops were put in after repeated and deep tillage, and with ample allowance of manure. The whole of the layer as top-dressed with peat or coal ashes in the first year, d what manure could be got or spared was put on the cond year before winter, when it was ploughed up. All the n crops were put in upon one shallow ploughing. We ve had no reason to repent of pursuing this course: but allow that one year only in clover would probably be re profitable. The land is not sufficiently fertile by to bear wheat after the first year of clover, instead of or making it into hay. This would bring it to some otations adopted in rich alluvial soils. It is a rule should never be transgressed, that after every crop there should be a remnant of manure sufficient to a good crop the next year; and that this should be in the land, and considered as stock in trade or invested at good interest. By means of judicious tions and tillage a much greater quantity of produce be raised at a certain expense of labour and capital, by any desultory and experimental mode of cropping. r should find it his own interest to cultivate his ording to the most approved principles, and the rd should impose only such restriction as will prevent nant from injuring himself by diminishing the pro- of his farm.

TATION, INTERCELLULAR. [SAP.]

TATO'RIA. One section of the Infusorial animals is d by M. Ehrenberg. It is arranged in the diploneurose division of the animal kingdom by Dr. Grant, a view which has been many times suggested to original observers, from the figure, division, and movements of the body. Ehrenberg's classification of these minute but often highly organised creatures is formed upon the same general model as that of the Polygastrica, there being in these the same double series of analogous nude and loricated forms.

General Character.—Swimming invertebral animals, apodal, often caudate, capable of executing rotatory movements by the aid of peculiar ciliated organs. No true heart, but a dorsal vessel, and transparent vessels in which no movements appear. No distinct branchiæ. Many nervous pharyngial ganglia (cerebral); in general a cervical nervous ring and an abdominal nerve. Very often eyes coloured red. Alimentary canal distinct and simple; sometimes a stomach, in other cases cœcal appendages; pharynx almost always armed with jaws, which often carry teeth. Sexual organs distinct, hermaphroditic; reproduction oviparous and viviparous, never fissiparous, as among Polygastrica.

Order 1. Rotatoria nuda. Order 2. Rotatoria loricata.

Section I. Monotrocha.

Ciliary Circle simple and entire, and not variable.

Monotrocha nuda.
1st Fam. Ichthydina.
A, No eyes.
  a, Body smooth.
    * Tail simple, truncated, and flexible.
      Gen. *Ptygura.*
    ** Tail bifurcate and very short.
      Gen. *Ichthydium.*
  aa, Dorsal part of the body hairy.
      Gen. *Chætonotus.*
B, Two eyes.
      Gen. *Glenophora.*

Monotrocha loricata.

Section II. Schizotrocha.

Ciliary circle simple, divided in parcels.

Schizopoda nuda.
1st Fam. Megalotrocha.
A, One eye.
      Gen. *Microdon.*
B, Two eyes, which are effaced with age.
      Gen. *Megalotrocha.*

Schizopoda loricata.
1st Fam. Floscularia.
A, No eyes. The envelope of the body gelatinous.
  a, Rotatory organs bilobate or quadrilobate.
      Gen. *Lacinularia.*

aa, Rotatory organ multifid.
* Rotatory organ quinquefid, mandibles dentate.
Gen. *Stephanoceras.*
** Rotatory organ with 6-8 divisions, mandibles edentate.
Gen. *Floscularia.*
B, Two eyes, which are effaced with age. Envelope of the body membranous and granular. Rotatory organ bilobate or quadrilobate.
Gen. *Melicerta.*

Section III. Polytrocha.

Several small ciliary circles.

Polytrocha nuda.
1st Fam. Hydatina.
A, No eyes.
a, Mandibles dentate.
Gen. *Hydatina.*
aa, Mandibles edentate.
* Mouth direct, terminal.
Gen. *Enteroplea.*
** Mouth oblique, inferior.
Gen. *Pleurotrocha.*

B, A single eye.
b, Eye frontal, tail bifurcate.
Gen. *Furcularia.*
bb, Eye dorsal.
* Tail simple, hairy.
Gen. *Monocerca.*
** Tail bifurcate.
† Frontal ciliæ similar.
Gen. *Notommata.*
†† Frontal ciliæ dissimilar.
§ With ciliæ and styles.
Gen. *Synchæta.*
§§ With ciliæ and hooks.
Gen. *Scaridium.*

C, Two eyes.
c, Eyes frontal.
* Tail bifurcate.
Gen. *Diglena.*
** Tail simple, front with two cirri.
Gen. *Triarthra.*
cc, Eyes dorsal.
* Tail simple.
Gen. *Rattulus.*
** Tail bifurcate.
Gen. *Distemma.*
D, Three eyes.
d, One eye dorsal, and two frontal.
Gen. *Eosphora.*
dd, Three dorsal eyes.
Gen. *Norops.*
E, Several eyes.
e, Eyes in a circle on the neck.
Gen. *Cycloglena.*
ee, Eyes in two cervical groups.
Gen. *Theorus.*

Polytrocha loricata.
1st Fam. Euchlanidota.
A, No eyes.
a, Cuirass depressed. Tail bifurcate.
Gen. *Lepadella.*
aa, Cuirass compressed.
* Tail simple.
Gen. *Monura.*
** Tail bifurcate.
Gen. *Colurus.*

B, One eye.
b, Cuirass depressed.
* Tail simple.
Gen. *Monostyla.*
** Tail bifurcate.
Gen. *Euchlanis.*
bb, Cuirass swollen or angular.
* Tail hairy and simple.
Gen. *Mastigocera.*
** Tail bifurcate or trifurcate.
† No cornicle.
Gen. *Salpina.*
†† Corniculated.
Gen. *Dinocharis.*

C, Two eyes (frontal).
c, Head nude.
Gen. *Metopidia.*
cc, Head hooded.
Gen. *Stephanops.*

D, Four frontal eyes.
Gen. *Squamelia.*

Zygotrocha.

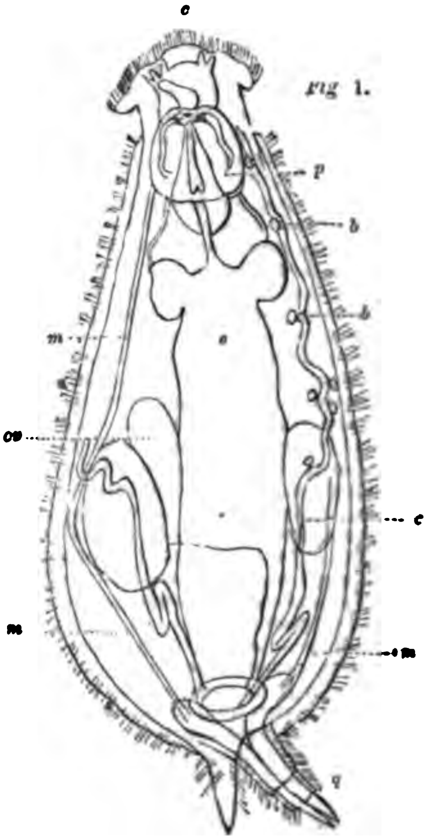
Two small ciliary coronæ.

Zygotrocha nuda.
1st Fam. *Philodinæa.*
A, No eyes.
a, Tail bifurcate and corniculate (a frontal proboscis).
Gen. *Callidina.*
aa, Tail bifurcate, not corniculate.
* Rotatory organs, supported on frontal pedicles of great length (no frontal proboscis).
Gen. *Hydrias.*
** Rotatory organs sessile and lateral (no frontal prolongation).
Gen. *Typhlina.*
B, Two eyes.
b. Eyes frontal.
* Tail bifurcate, and with two pairs of horns (thus becoming six-pointed); a frontal proboscis.
Gen. *Rotifer.*
** Tail trifid, and with a single pair of horns (thus becoming five-pointed); a frontal proboscis.
Gen. *Actinurus.*
*** Tail bifurcate, and without horns; no frontal prolongation.
Gen. *Monolabis.*
bb, Eyes dorsal.
(Tail bifurcate, and with ten pair of cornicles; a frontal prolongation.)
Gen. *Philodina.*

Zygotrocha loricata.
1st Fam. *Brachionæa.*
A, No eyes.
Gen. *Noteus.*
B, One eye.
b. No tail.
Gen. *Ano*
bb, Tail bifur
Gen.
C, Two eyes (frontal).
Gen. *Pte*

In illustration of this classification, we present ings of—

Notommata centrura, as an example of nude chous Rotatoria; and of—



Notommata centrura. The branchial apparatus (b, cs) [illegible] on the l

ıs urceolaris, as an example of loricate Zygotro-
oria.

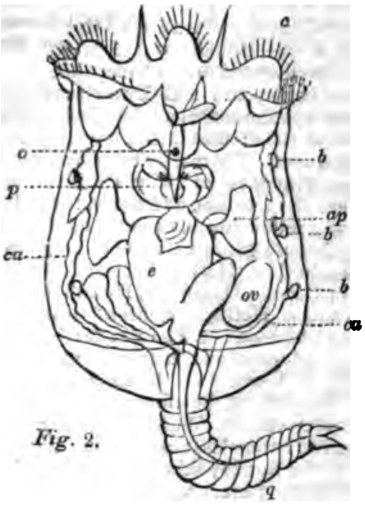


Fig. 2.

Branchionus urceolaris.

toriæ. *p*, pharynx. *e*, stomach. *a p*, appendages to stomach.
o, eye. *m*, muscles. *q*, tail. *b b*, internal branchiæ. *c a*, bran-

a musical instrument of former times, mentioned
ly French writers of Romance, and by Chaucer,
others among our early poets: it seems to have
ar to what the French call a *vielle*, and the Eng-
ly-gurdy.

LA, a genus belonging to the *Turbinacés* of
[TROCHIDÆ.]

ER. [SUSSEX; YORKSHIRE.]

ERHAM, a parish and market-town in the south-
art of the West Riding of Yorkshire, 6 miles
ld, 12 from Barnsley, 12 from Doncaster, 160 from
the road, and 171 by railway. The Don, after re-
Rother at the eastern extremity of the town, takes
direction, and Rotherham occupies an elevated
which rises from the northern bank of the river.
estern side of the town the river bends to the
. The parish comprises an area of 12,810 acres
square miles), and consists of the townships of
, Kimberworth, Brinsworth, Catcliffe, and Dal-
e chapelries of Tinsley and Greasbrough. The
uburb of Masbrough is on the left bank of the
comprised in the township of Rotherham, with
is united by a handsome stone bridge of five

mile south of the town, on the south bank of the
are some Roman remains, which consist of a
r encampment called Temple Brough; and, at a
300 yards higher up the river, there is an earth-
h it is conjectured formed part of a larger work.
ns, bricks, and pottery have been found on both
The station 'Ad Fines,' on the great road from
ster to Castleford, is fixed at Temple Brough by
uthorities. There is however nothing to give
a claim to a Roman origin, but it probably
very early in the Saxon period. The church at
n was in that period the only ecclesiastical edifice
sive district, and tithe was paid to it from lands
g the parishes of Ecclesfield, Sheffield, Hands-
ston, and Whiston, in addition to those which are
within the parish at the present time. (Hunter's
kshire.) A weekly market and annual fair were
the Conquest; the Saxon lord of the manor had
mill; and these were sufficient, with its eccle-
eriority, to render Rotherham a vil of some im-
The Saxon possessor of the manor being dis-
the Conquest, Nigel Fossard, a Norman, was
ed under the earl of Morton. In the reign of
.. (13th century), the manor and church were
the monks of Rufford Abbey, in Nottingham-
the rights which had been exercised by the
dal possessors, such as regulating weights and
the assize of bread and beer, punishment of criminals, for which purpose they had a pillory, tumbrel, and gallows. In 1307, Edward I. granted the town another market and a second fair. The parish church was built in the reign of Edward IV. (15th century), and is one of the handsomest in the diocese. Thomas Rotherham, archbishop of York, a native of the place, born in 1423, lent his assistance towards rendering it a model of ecclesiastical architecture. There are several good engravings of the church. The living is a vicarage, and the average net income in 1829-30-31 was 170*l*. An old font, supposed to have belonged to the Saxon church, at present stands in the churchyard. To Archbishop Rotherham also his native town was indebted for the foundation of a college, the remains of which still exist, and are used as an inn. This college was founded in 1482 for a provost, three fellows, and six scholars, who were lodged at the college, and accommodation was at the same time provided for the several priests officiating in the different chantries in the church. Grammar, poetry, rhetoric, music, singing, writing, and arithmetic were taught in this college, which was suppressed in the reign of Edward VI. The bridge-chapel on the Don, which does not appear to have been endowed, is now used as the town gaol. The old road from London to Carlisle passed through Rotherham. Charles I. during the civil war passed a night in the town: to one of the inhabitants, who held the stirrup while he mounted his horse, he gave as a memorial a coin of Richard I., which is still in possession of the family of Clarke residing in Rotherham.

There is no single constituted authority for the purposes of municipal government. The 'feoffees of the common lands of Rotherham' are the most important local body. They consist of twelve inhabitants elected for life by the freeholders and rate-payers of the township, and they have the management of certain lands bought by the inhabitants of Queen Elizabeth. The total income at their disposal is at present about 600*l*. a year, a considerable proportion of which is expended in the improvement of the town and in other objects of public utility. Mr. Hunter states (*South Yorkshire*) that he has inquired in vain for the decree or patent under which the feoffees act. The town is lighted under a local act obtained in 1801. A gas-company was established in 1833, but is not incorporated, nor is the water-company, which was formed in 1827. The police is regulated by a general local act (3 and 4 Wm. IV., c. 90), and consists of a day and night watch, for which the township only is rated. The county magistrates sit in petty sessions every Monday, and offenders are committed temporarily to the town gaol. The Midsummer quarter-sessions for the West Riding are held at Rotherham. A court of requests was established in 1839, and its jurisdiction extends to places in the vicinity. Rotherham is the centre of a union under the Poor-Law Amendment Act. The expenditure for the relief of the poor averaged 2808*l*. for the parish, before the union, and in 1838 the expenditure was 1790*l*.

Great improvements have recently taken place in the general appearance of the town. Streets have been widened, old houses pulled down, and many good buildings erected. The materials for building are abundant, the town itself standing upon a mass of the old red-sandstone. Besides the parish church, there is a chapel at Tinsley, a small antient edifice; a church at Greasbrough, built in 1826, with the aid afforded by the Church-Building Commissioners and voluntary contributions; a new church at Thorpe; and a new church at Kimberworth will be completed in 1842. The oldest chapel for Protestant dissenters was built by the Presbyterians in 1705, and is now used by the Unitarians; it was repaired and enlarged in 1840. The Independent chapel, situated in Masbrough, was built towards the end of the last century, and has been once enlarged. The Wesleyan Methodist chapel, built in 1805, has been twice enlarged. A Primitive Methodist chapel has been opened since 1820. In 1836, a handsome Baptist chapel was erected; and within the last three years the service of the Roman Catholic church has been performed in a building formerly occupied as a theatre. The court-house, in which the Midsummer quarter-sessions are held, was built by the county in 1827, and is the most convenient in the Riding. The library, news-room, and dispensary occupy a plain substantial building erected in 1828. The dispensary was established in 1806, and affords medical aid to between 500 and 600 patients yearly. Almshouses for four poor unmarried women were founded in 1780 by Mrs. Mary Bellamy.

Rotherham possesses many important advantages calculated to encourage manufactures. Extensive beds of coal, of a quality suitable to manufacturing processes, exist in nearly every part of the parish, and iron-ore is also abundant. Leland notices, in the sixteenth century, that a mile from Rotherham 'be veri good pittes of coal;' and also that in the town 'be veri good smithes for all cutting-tools;' but it was not until about a century ago that any extensive manufacturing operations began to be carried on. In 1746, the Walkers established a work for the manufacture of cast-iron goods of all kinds; and at the large establishments which originated in their enterprise, great part of the cannon used in the navy during the American and French wars was cast, and for a considerable period nearly the whole country was supplied by them with cast-iron goods. The iron bridges at Sunderland, Yarm, Staines, and the Southwark-bridge over the Thames were cast at their works. After a period of inactivity which followed the close of the war, the various branches of the iron-manufacture are again carried on with great vigour, many new establishments have been commenced, and a greater variety of articles is produced. Stoves, fenders, engineering and millwork, and many kinds of hardware goods are now made. Glass, earthenware, starch, soap, naphtha, pyroligneous acid, are manufactured at Rotherham. There are two extensive ale and porter breweries, and vessels of 50 tons burthen are occasionally built in yards adjoining the Don. A flax-mill has been carried on for several years. The markets for corn and cattle are held on Monday: both are of great importance; but every alternate Monday the cattle-market is one of the largest in the county, and is attended by buyers from Manchester and other towns at a great distance. There is a covered stone building in the market-place for the accommodation of the dealers in butter, poultry, and eggs; and the feoffees are intending to render it more convenient by enclosing one of the sides. The shambles occupy the northern sides of the market, and were built by the feoffees. The fairs are for horses and cattle chiefly, and in November there is a statute fair for hiring servants.

Besides the various natural advantages which the manufacturers of Rotherham enjoy, there are few places possessing such extensive facilities for traffic. The Don was made navigable from Doncaster to Tinsley (the latter place situated between Rotherham and Sheffield) in 1720; and in 1820 the navigation was extended from Tinsley to Sheffield by a canal. The Don gives to the town the means of exporting and importing commodities by water to and from all the great manufacturing towns of Yorkshire and Lancashire, and it communicates with the Trent by the Stainforth and Keadby canal. The Sheffield and Rotherham railway was opened in 1838. It commences in West-gate, Rotherham, where a handsome station is building, is carried across the Don by a wooden bridge, receives a branch from the Greasbrough collieries, and another from the North Midland Railway, and terminates in the Wicker, Sheffield. Trains depart from each terminus every hour during the day; and the distance between the two towns, which is 5¼ miles, is performed in about fifteen minutes: the lowest fare is sixpence. Upwards of a million of passengers had been conveyed along the line in the two years ending October 1840. The Rotherham station on the North Midland Railway is one of the most important on the line, being used by Sheffield on the one hand, and by Rotherham and an extensive district eastward: it is a handsome stone edifice with a spacious waiting-room and offices. This railway, which connects Leeds, York, and Hull, and the counties of Durham and Northumberland, with the midland and western counties and the metropolis, passes through a considerable portion of the parish, and has greatly increased the value of property adjacent to it. At the Ickles, a hamlet in the parish, it is carried over the Don and the Sheffield road by a fine viaduct of twenty-five arches. The communication between London and Rotherham is effected in about 8¼ hours.

The population of the parish and township at the four periods when the census was taken, was as follows:—

	1801.	1811.	1821.	1831.
Township .	3070	2950	3548	4083
Total of parish	8418	8671	9623	10,387

The population of the parish is at present estimated at 12,000, and that of the township, at 5000: in the latter the rent of houses is rising, though many new houses have been lately built. The population of the different divisions of the parish, in 1831, was as follows:—Rotherham (as before stated), 4083; Kimberworth, 4031; Greasbrough, 1280; Tinsley, 368; Brinsworth, 229; Catcliffe, 196; Dalton, 187; Orgreave, 35.

The establishments for education at Rotherham are:—1, The Independent academy, situated in Masbrough, at which 25 young men are educated for the Independent ministry, under a tutor in theology and a tutor in classics: the institution is supported by voluntary contributions. 2, The grammar-school, founded in 1584: the classics are taught gratuitously to the boys of the town. The master has a house rent-free, and the total endowment is about 30*l*. per annum, to which the feoffees, who are the trustees, add a gratuity. The scholars have a claim to a fellowship and two scholarships in Emmanuel College, Cambridge, in case the same are not occupied from the free-school at Normanton; and there is a fellowship at Lincoln College, Oxford. 3, Hollis's School, founded in 1663, by Thomas Hollis, a Nonconformist, for the education of thirty children. 4, The Feoffees' school: 25 boys and 20 girls are educated and instructed in reading, writing, and arithmetic. 5, A school on the Lancasterian system, for 200 boys and 200 girls. 6, Boarding, common day, and dame schools. 7, Sunday-schools. We have no accurate information respecting the two latter classes of schools. Lending libraries are attached to the Sunday-schools of nearly each denomination. The public library was established in 1775, and contains about 3000 volumes, including the publications of the 'Record Commission.' There are nearly 90 annual subscribers. Rotherham was one of the earliest towns in establishing a subscription library, but there is neither a mechanics' institute, mechanics' library, nor savings'-bank in the town. There is a small library of theology in the church, for the purchase of which the sum of 100*l*. was left a century ago.

ROTHERHITHE. [SURREY.]

ROTHESAY, or ROTHSAY, a burgh in Scotland, in the island of Bute, chief town of the county of Bute, 52 miles from Glasgow, or 19 from Greenock; in 55° 51′ N. lat. and 5° 1′ W. long.

Rothesay owes its origin to a castle erected here about A.D. 1098, by Magnus, king of Norway, to secure the Western isles of Scotland, which he then held. Under the protection of this castle a village was formed, and, under the patronage of the Stuart family, to whom it belonged, rose to importance. Robert III. raised it from being a burgh of barony to the rank of a royal burgh, and James VI., A.D. 1585, further augmented its municipal privileges. It suffered much in the wars of the middle ages, and was repeatedly taken and plundered by the English, the Norwegians, and the Lords of the Isles. It was seized by the Duke of Argyle in his invasion, A.D. 1685. In the early part of the last century many of the inhabitants left it, in order to settle at Campbelltown, and the town appeared like a desert, but since then it has much revived.

The town stands on the east side of the island, at the bottom of a small bay. It consists of several streets and lanes; and has been enlarged along the shore on each side of the old part of the town, by the addition of villas and lodging-houses for the accommodation of the bathers who resort here in the summer from Glasgow, and to whom the place is recommended by its mild and healthy climate and pleasant situation.

Rothesay Castle, a tall heavy-looking ruin, consisting of a circular enclosure with massive walls flanked with round towers built of red stone, stands in the middle of the town. The town-hall and county buildings, a handsome castellated structure with an elegant tower, and the prison for the county, are adjacent to the castle. The kirk is a modern building about a mile from the town. There are two chapels-of-ease, one of them Gaelic: a third chapel-of-ease, of elegant architecture, has been built by the Marquis of Bute in the northern part of the parish. There are three or four dissenting places of worship in the parish. Close to the parish church are the ruins of the antient church of St. Mary, once the cathedral of the bishopric of the Isles: the walls of the choir, and one or two antient monuments, are standing.

The population returns of 1831 were as follows:—

	Inhabit houses.	Families.	Persons.
Burgh . .	549	1148	4817
Rest of parish .	208	242	1267
	757	1390	6084

About one-third of the population of the part of the parish luded in the burgh is agricultural. By a subsequent t carefully taken in 1837, the population was given at or the burgh, and 1165 for the rest of the parish; 089.

re are a cotton mill and a power-loom factory, a tan- wo boat-building yards, and several cooperages. The g fishery is carried on. There are three banks, es of the Greenock, the Renfrewshire, and the Bank. The harbour was formed A.D. 1822, and has nd building dock, either now finished or in course of ction, adjacent to it. The exports are cotton yarn ton goods, herrings, fresh fish, barley, turnips, pota- e-grass seeds, small timber, and leather; the imports r cotton, cotton yarn, hides, wheat, oats, flour, beans, ust, lime, freestone, coals, salt, and barrel staves. were, in 1837, 58 vessels belonging to the port, of from 00 tons, total registered tonnage 2950: men 255, em- in the coasting trade, foreign trade, or fishery. There nmunication by steam-boats with Glasgow. There is y market, and there are three fairs of little import- Port Bannatyne, a village in the parish, with a popu- of about 300 persons, has 25 small vessels engaged in rring fishery.

parish is in the presbytery of Donoon, in the synod of . There were, in 1840, fifteen schools in the parish, ng one parochial school with three assistant teachers, hools endowed by the Marquis of Bute, and three which are partially assisted. The number of scholars e schools, in the spring of 1840, was 921, nearly one- f the whole population. The management of the is considered to be very good, and there is scarcely a person brought up in the parish who cannot read and

There are in the parish six public libraries and two reading-rooms. A periodical publication, 'The Bute l of Rural Affairs,' has lately been established: it is to agriculturalists. There are several friendly socie- d a savings' bank.

burgh is governed by a provost, two bailies, a dean ld, a treasurer, and twelve councillors. Burgh courts, and justice of the peace courts, and county meet- e held here. The burgh formerly united with Ayr, Campbelltown, and Inverary in returning a member iament. By the Scottish Reform Act it was disfran- as a parliamentary burgh, and added to the county of but by way of compensation, that county, which had usly returned a member alternately with Caithness, llowed to return one constantly. (*New Statistical t of Scotland; Parliamentary Papers.*)

TBOELLA, a genus of the tribe Rottboelliaceæ, of y natural and extensive family of grasses, named by own in honour of C. F. Rottböll, a Professor of at Copenhagen, who died in 1797, and who pub- several works, one in particular on exotic species mineæ and Cyperaceæ. The genus is distributed hout Asia, especially India, New Holland, and the l islands, and extends also to Egypt. The species ally tall, erect, and flat-leaved, with the spikes round ; spikelets two in each joint, pressed close to or a hollow in the rhachis; of these one is sessile, the lked. The species are not relished by cattle, with the on of R. glabra, of which they are said to be fond in

TEN-STONE occurs massive. Fracture uneven. greyish, reddish, or blackish brown. Dull, earthy, aque. Soft, soils the fingers, and is fetid when or scraped. Found near Bakewell, Derbyshire, in and at Albany in the state of New York.

employed in polishing metals, &c.

lysis by R. Phillips:—

Alumina	86
Silica	4
Carbonaceous matter . .	10
	100

TENHAMER, JOHN, was born at Munich in nd received instruction in the rudiments of painting n obscure artist named Donhaur or Donower. Early he went to Rome, and became known for small his- compositions painted on copper in a style of most finishing. Emboldened by success, he undertook t for one of the churches of Rome a large altar- representing several saints and a glory of angels, a which, when completed, excited astonishment at the extent and versatility of his talents. This work he afterwards repeated for the church of Santa Croce at Mantua. He visited Venice, and studied the colouring of Tintoretto, whose style he imitated with great exactness. Whilst at Venice, he painted some pictures for the public edifices, two of which are mentioned by Lanzi, namely, a Santa Cristina at the Incurabili, and an Annunciation at San Bartolommeo; but that writer speaks in slighting terms of these works, and generally so of the talent of the painter. During his stay in Italy, which lasted several years, he was patronised by Ferdinand, duke of Milan, for whom he painted, amongst numerous works, a picture of Nymphs dancing, which was much admired.

He returned to his native country, and established himself at Augsburg, where he was much employed. For the emperor Rudolph II. he painted a fine picture of the Feast of the Gods, a composition of many figures, gracefully designed, and coloured with the splendour of the Venetian school. Many of his backgrounds were painted by John Breughel, and some by Paul Bril. He was partial to the introduction of gaudy accessories into his pictures, which he frequently enlivened by naked figures designed with taste and coloured with delicacy. His heads are expressive, but present too much sameness of appearance, and his design, though tolerably correct, is generally formal and mannered. There were eight of his important pictures in the gallery of the Louvre, which were removed in 1815, and returned to Prussia, Holland, and Austria, whence they had been taken. Though greatly employed, Rottenhamer died in poverty, and was buried by subscription at Augsburg, where he died in 1604, or, according to Bryan, in 1606. Lanzi says that he visited England, and that he died here, but this appears to be a mistake, as we find no mention of him in the 'Anecdotes of Painting,' and it is very improbable that so industrious an investigator as Mr. Vertue would have omitted in his memoranda any mention of an artist so generally known, if he had resided in this country.

(Bryan's *Dict.; Biographie Universelle;* Lanzi, *Storia Pittorica*, iii. 123.)

ROTTERDAM, the capital of the province of South Holland, in the kingdom of the Netherlands, is situated in 51° 55′ N. lat. and 4° 29′ E. long., on the north bank of the river Maas, about twenty miles from the mouth of that river, which here resembles an arm of the sea. It is in the form of a triangle, the base of which, about a mile and a half in length, extends along the bank of the Maas; it makes a very striking appearance, especially when it is approached by water from Dordrecht. It derives its name from the little river Rotte, which runs through the middle of the city, and falls into the Maas. The town is not fortified, but is surrounded by a moat, and has six gates towards the land and four towards the water. The part called the Binnenstad (*i.e.* the inner town) has many narrow streets, and is separated by the High-street from the outer town (Buitenstad), which contains the fine houses of the rich merchants, and is intersected by numerous canals connected with the river, on which the largest merchantmen can come up and unload at the very doors of the warehouses. Along the Maas are many fine quays, the handsomest of which, called the Boomtjes (from the rows of trees with which it is planted), consists of a long row of stately houses facing the river, with a broad and deep canal in the rear, parallel to the river. A canal from Helvoetsluys to Rotterdam was made in the years 1827 to 1830. The iron railway, already completed between Amsterdam and Haarlem, is to be prolonged to Rotterdam. The great church of St. Lawrence contains the tombs of admirals De Witte, Kortenaar, Brukel, De Liefae, and others, most of whom fell in the wars with England and France, between 1660 and 1674. Besides this church there are many churches and chapels of the Dutch and Scotch Calvinists, French Protestants, English Episcopalians, Presbyterians, Baptists, Roman Catholics, a Jews' synagogue, &c. The Exchange is larger and handsomer than that of Amsterdam. The other principal buildings are the town-house, a very antient edifice, the Admiralty, the Academy, the Dutch theatre, the magazines of the East India Company, and some manufactories. The commerce of Rotterdam extends to all parts of the world, and embraces almost every kind of produce and manufacture. In the year 1840 the number of ships that entered inwards was 1671, of which 1543 were with cargoes amounting to 321,308 tons, and 128 (of 8276 tons) in ballast. The number that cleared outwards was 1835, in all 354,334 tons, of which 1394 were with cargoes to the amount of 279,517 tons.

Rotterdam contains many valuable collections of works of art, an academy of sciences, a public library, and other useful institutions. Rotterdam is the birth-place of several celebrated men, among whom are the great painter Adrian van der Werf, and the learned Erasmus, a bronze statue of whom, ten feet high, stands in the great market-place. The population of Rotterdam has much increased of late years; in 1840 it amounted to 78,098, of whom 51,765 were Protestants, 23,295 Roman Catholics, and about 2800 Jews. (Stein; Hassel; Hörschelmann; *Dutch Official Journal.*)

ROTTERDAM, NEW, is one of the islands which constitute the group of the Friendly or Tonga Islands, and is situated in 20° 15′ S. lat. and 174° 48′ W. long. This island was discovered by Tasman (1643), and named New Rotterdam, but it is now better known as Annamooka, or Namooca, as Mariner writes it, which is the name given to it by the inhabitants. The island is about twelve miles in circumference, and in the middle there is a lagoon which is a mile and a half across. The island is low, and surrounded by a sea with regular soundings. At a distance of from two to three miles from the shore, the depth varies between 25 and 30 fathoms. On the north-western side there is a roadstead called Van der Luys by Tasman, on which Cook anchored in 1773 and 1777. As to its productions and inhabitants see FRIENDLY ISLANDS. (Cook's *Voyages*; Mariner's *Account of the Natives of the Tonga Islands*; Krusenstern's *Atlas de l'Océan Pacifique.*)

ROTTI. [TIMOR.]

ROTTLE'RA, a genus of plants named in honour of Dr. Rottler, a native of Denmark, who was sent out to India by the Church Missionary Society, and was distinguished there for his labours as a missionary for the space of nearly 50 years, as well as for his acquaintance with the Tamul language, on a dictionary of which he was long engaged, as also for the attention he paid to botany, having formed one of the knot of early botanists at Tranquebar, who, with Koenig, were the first since the time of Rheede to study that science in the peninsula of India. Dr. Rottler's extensive Indian Herbarium is deposited in the museum of King's College, London.

The genus belongs to the natural family of Euphorbiaceæ, but the same name was applied by Vahl to one of the Cyrtandaceæ. It is characterised by having male and female flowers upon different plants. Male:—Calyx 3-5 partite. Corol none. Stamens 30 to 40, inserted into the convex receptacle. Filaments free or united at the base. Female:—Ovary 2-3-4 celled, each one-seeded. Style deeply, 2-3-4 partite, laciniated. Capsule 2, 3, or 4 coccous, each one-seeded. The genus, which is found in the tropical parts of Asia and throughout India, contains handsome moderate-sized trees. R. tetracocca grows in Silhet, and yields a hard and valuable timber. The capsules of R. tinctoria, a native of the Coromandel coast, and extending to the forests of Northern India, are covered with short stiff hairs, which, when rubbed off, have the appearance of a powder of a fine red colour, which is employed in India in dyeing silk of a scarlet colour, and therefore forms an article of commerce in that country. Dr. Royle, 'Illustr. Himal. Bot.,' p. 329, states that this strigose pubescence is also employed in India as an anthelmintic in the same way that cowhage is, and, like it, probably acts mechanically in expelling intestinal worms.

ROTUNDA, a term applied to buildings which are circular in their plan both externally and internally, or else to halls and other apartments of that shape, included within and forming merely a portion of the edifice containing them. The technical application of the term is however restricted to circular buildings whose height does not much exceed their diameter, for we should not describe a lofty cylindrical edifice, such as a round tower, by the term rotunda; while on the contrary it is frequently employed to designate polygonal buildings which approach in their general form to the circle: for instance, the Colosseum in the Regent's Park, London, might without any great impropriety be classed among rotundas, it being a polygon of sixteen sides, which accordingly form very obtuse angles.

We need not here repeat what has been said on the subject of circular plans in the article ROMAN ARCHITECTURE, and therefore proceed to remark, that notwithstanding their beauty, there are very few instances indeed of what can strictly be termed rotundas. In fact, such shape is utterly unsuited to buildings in general, whatever their particular purpose may be, unless it be one for which nothing more than a single spacious hall or area is required internally. It does not admit of being divided within into regular-shaped rooms, without very great loss of space, and therefore although plans of the kind have occasionally been attempted upon paper, they are to be looked upon chiefly as ingenious architectural exercises and experiments. We have however an instance of a plan of the kind being carried into execution at the Marquis of Bristol's seat at Ickworth, near Bury St. Edmund's, the body of the mansion (115 feet by 100) being an elliptical and therefore a round structure, though not perfectly circular; but striking as the external effect certainly is, too much is sacrificed to it. In the Rue de Pigalle, Paris, is a rotunda-house, about 50 feet in diameter, built by the architect Henry, in 1788. Even among public buildings there are very few for which the circle can with propriety be adopted as the figure of the entire plan: accordingly instances of it are very rare. It is applicable only where a large space is to be provided as a place of public rendezvous or assemblage, where it is desirable to have compactness and an area unobstructed by columns, which in a square one of the same superficial extent would be indispensable in order to support the roof. Therefore though it is well adapted for an Exchange, a market-hall, or similar places, and can hardly be made available for any others, it is nevertheless very rarely resorted to even for them. The Halle des Blés, or Corn-Exchange, at Paris, is almost the only example of the kind that occurs to us.

In ecclesiastical architecture circular and polygonal structures were by no means uncommon among the early Christians, especially for baptisteries and sepulchral chapels. The tomb of Theodoric, or what is now called Santa Maria Rotunda, at Ravenna, is a singular example, having a flattish or segmental dome (about 34 feet in diameter) cut out of a single block of stone. Of San Stefano Rotundo and Santa Costanza mention has been made under ROMAN ARCHITECTURE, and to them may be here added the Rotunda or Church of Santa Maria Maggiore at Nocera, a work of about the same period. While it greatly resembles Santa Costanza in plan, having coupled columns placed on the radiating lines from the centre, and with arches springing from them, it differs altogether in section from both those examples, there being no cylindrical wall or tambour above the colonnade, but the dome springs immediately from the columns, and the arches groining into it. Consequently the proportions are much lower, the diameter of the space enclosed by the columns being 39 feet, and the height to the top of the dome 42,—proportions differing very little from those of the Pantheon. The extreme internal diameter is 78 feet. The earlier edifices of this class are, for the most part, of moderate dimensions, but others were afterwards erected on a larger scale, and among them is the celebrated Baptistery at Pisa [BAPTISTERY], which is externally about 120 feet in diameter, and 100 in height, exclusively of the dome. Besides being remarkable on account of its style, this edifice presents other architectural peculiarities, one of which is that the central area is covered by a conical roof, the upper part of which is carried up so as to pierce the external dome, and, except that it has no openings, to appear like a lantern placed upon it. Woods therefore conjectures that the interior cone originally formed a spire, and that the external dome was an after addition to the structure. [BAPTISTERY.]

The rotunda became afterwards in a manner incorporated with or added to the cruciform plan, being raised aloft and placed over that part of it where the transepts intersect the body of the edifice. Nearly all modern cupolas may be described as rotundas elevated above the rest of the building and viewed by looking up into them from below. Thus supposing there was a floor at the level of the whispering gallery at St. Paul's, the dome and space beneath it would form a perfect and well proportioned rotunda, whose height and diameter would very nearly be the same.

In itself alone the rotunda form does not accommodate itself to the purposes of a church; it does not afford space for the processions and occasional ceremonies required by the Roman Cathòlic worship; nor is it better fitted for the Protestant service, since besides that nearly all its beauty would be destroyed by the floor being covered with pews, it requires an amphitheatrical arrangement of seats in concentric curves. Neither is it a form that can be enlarged to any required capacity, for 140 feet is almost the maximum f diameter that can be adopted for a space to be covered y a dome. Even the Pantheon at Rome, which may be aken as that maximum, is but of moderate size—an area carcely at all exceeding the *core* of St. Peter's, the uomo at Florence, &c., that is, merely the central part eneath the cupola. Rotundas are accordingly rare even Roman Catholic churches, yet although such structures re necessarily limited by their form to a moderate size, ey derive from it also a grandeur which would not be roduced by the same scale according to any other plan. leither grandeur nor beauty however results as matter of ourse from the plan alone, because whatever charm that ossesses may be nullified by other circumstances. There , for instance, nothing of the one and not very much more the other in the rotunda interior of St. Peter-le-Poor's, ondon, the only instance we are acquainted with of such lan being adopted for a Protestant church. The arrangement of the pews and seats in parallel rows, strikes as a able contradiction to the shape of the building; be- ues which the vaulted dome, which is almost essential to ch plan, is wanting, a cove and lantern with windows ing substituted for it; owing to which the character of e whole becomes something different. A better example a rotunda may be seen in that of the Bank of England.

Of late years one or two structures of the kind have been cted, viz. the church designed and built by Canova at own expense at Possagno; that of San Francesco di aola, by Bianchi, at Naples; the Madre di Iddio, Turin; d the new Catholic church at Darmstadt, by Moller. he first mentioned of these, the first stone of which was id in July, 1819, ranks high among the few architec- ks of importance which Italy has produced within nt century, and is remarkable for its portico being most the only instance of the application of the Athenian oric in that country, certainly the only one upon so large scale. As a plan of the portico is shown in PORTICO, *fig.* all that we need mention in regard to that feature is, that e columns are 35 feet in height; the entire height from e ground to the apex of the pediment, 79; and the dth of the portico, 90; therefore the dimensions of the are very nearly equal to those of the Parthenon, the ence in the height of the columns being only 10 inches. rotunda itself is about 45 feet less in its internal diame- the Pantheon, but is still sufficiently ample to be pos In its proportions, and in its coffered dome, the tre which has a glazed opening to light the whole erior, it resembles the Roman structure; not so how- r in design, for the architecture errs as much in being too in and cold, as that of the other building does in being ken into too many parts, and too much cut up by heavy ament. Like the Pantheon, the plan is divided into eight partments, all of which form as many arched recesses; t within which is placed the door, and the opposite one ming a deep sanctuary for the high altar), being rather ier than the rest. The arches themselves are quite plain, hout either keystones or archivolts, and, except the taber- les or altars within the recesses, the only decoration is that duced by the panels filled with sculpture, in the spaces ween the arches. Nevertheless, taken altogether, it is a le monument, especially when it is considered that it raised by a private individual.

nstead of attempting to describe other examples of ro- in a similar manner, we shall put our notices rela- them into a condensed form, and for convenience e shall include those already mentioned, as their relative can thereby be more readily compared.

theon, Rome. External diameter 188 feet, internal nternal height 142. [PANTHEON.]

of Minerva Medica. External diameter 110 erior a decagon 78 feet in diameter and 105 high.

Costanza, Rome. Extreme internal diameter 140 eter of rotunda within the peristyle and beneath me , height of dome 130.

Nocera, Santa Maria. Extreme internal diameter 78 t, diameter of dome and peristyle 39, height 42.

Rotunda, Forum Caracalla. Exterior diameter about 0 feet. Corinthian portico hexastyle, triprostyle. In- ter 80 feet, height of order 48, entire height

nda at S. Pietro in Montorio, Rome. (Bramante.) enclosed by a Doric peristyle of 16 columns. In- diameter 22 feet, height 48. This edifice is generally l as a classical piece of architecture, but it has many striking defects, and the balustrade (without pedestals) over the peristyle is intolerable.

Madonna di Campagna, Verona. (Sanmicheli.) Exterior 74 feet in diameter, nearly surrounded by a low Doric peristyle of 28 columns, making the entire diameter below 118 feet. Interior an octagon 64 feet in diameter and 101 high.

Capella Pelligrini, Verona. (Sanmicheli.) Elegant in plan, but enormously disproportioned in section. External diameter 40 feet, internal 30. Two orders within. Height to spring of dome 46 feet, entire height 64.

La Maddelina, Venice. (Temanza.) Internal diameter 55½ feet, height to spring of dome 36, entire height 63, or 7½ more than diameter. Arrangement hexagonal, *i.e.* six arched compartments.

Halle des Blés, Paris. (De Mezières.) External diameter 228 feet, interior diameter of the rotunda beneath the dome 127, height to spring of dome 42½, to summit 105.

Possagno. (Canova.) External diameter 116 feet; width of portico 90, projection of portico 55, height of stylobate 10½, internal diameter 90, height 90.

Madre di Iddio, Turin. (Buonsignore.) A rotunda about 130 feet in diameter, with hexastyle, diprostyle, Corinthian portico. Internal diameter 74 feet, height 100; plan four semicircular tribunes, with two Corinthian columns in front of each, bearing the entablature continued over those spaces. Attic with a long panel over each of the four recesses.

Museum of the Vatican, Rotunda. (Simonetti.) Divided into ten recessed compartments: diameter 50 feet.

Berlin Museum, Central Hall. (Schinkel.) Diameter 67 feet, height of gallery supported by a peristyle of twenty Corinthian columns, around the lower part 21; height to spring of dome 42 feet, entire height 70.

Catholic Church, Darmstadt. (Moller.) Extreme internal diameter 135 feet, peristyle of twenty-eight Corinthian columns supporting dome; diameter of dome and peristyle 102 feet, height to spring of dome 48 feet, to summit 102.

Radcliffe Library, Oxford. (Gibbs.) Basement a polygon of 16 sides, and 104 feet in diameter. Extreme exterior height 140 feet, interior diameter 88, interior diameter of central space and dome 52, height 90.

ROUBAIX, a town in France, in the department of Nord, about 6 miles north-east of Lille, and 146 north-north-east of Paris. It is of no historical interest; it owes its prosperity to its manufactures, which were introduced under the ministry of Colbert. The town stands about midway between the Escaut or Schelde and the Lys, but at a considerable distance from both. It communicates however with the Lys by means of the canal of Roubaix, which opens into the Deule canal. [NORD.] The town consists of large, neat, and well-built houses. The population in 1831 was 12,443 for the town, or 18,187 for the whole commune. The staple business of the place is the cotton-manufacture, which is carried on in all its branches with considerable activity. Some woollens are also manufactured. Archil (or litmus), and azure (or finely powdered smalt), and machinery of various kinds are made; and dyeing and tanning are carried on. There are twenty-five fairs in the year. The manufactures of Roubaix render it a place of great resort for merchants, both of France and other countries. There are a chamber of manufactures and an hospital. The town long laboured under a want of water, but the deficiency has been supplied of late years by means of Artesian wells. The manufactures of Roubaix are exported to the French colonies and to South America.

ROUBILIAC, LOUIS FRANÇOIS, an eminent sculptor, born at Lyon in France, but long resident in England, where all the works by which he gained his reputation were executed. It is not known at what period Roubiliac came to this country. The earliest notice of him as an artist is that he was recommended by Sir Edward Walpole to execute several busts for Trinity College, Dublin. He was afterwards employed, through the same interest, on the monument of John, duke of Argyle, in which he was so successful, that his claims to the highest honours of his profession were at once admitted, and, as he became the fashion, his practice was soon greater than that of the most popular artists of the day. Rysbrach, who also was settled in England, and who, till Roubiliac and Scheemacker appeared, was employed in all important works in sculpture, was neglected, and his merits forgotten in the desire to do honour to the new favourite. Roubiliac's chief works are the above-mentioned monument of the Duke of Argyle, that of Sir Peter Warren, and of the Nightingale family, all in Westminster Abbey; those of the Duke and Duchess of Montague, in Northamptonshire; and one in memory of Bishop Hough, in Worcester cathedral. His principal statues are of George I., at Cambridge; of George II., in Golden Square, London; of Handel, the composer, in Westminster Abbey; and those of the Duke of Somerset and Sir Isaac Newton, both at Cambridge. His busts are very numerous.

Of the high merit of Roubiliac there can be no doubt. The monuments of Mr. Nightingale and his lady, the statue of Eloquence in the Argyle monument, the draped figure in Bishop Hough's monument, and the statue of Newton, are proofs of great power both in invention and expression, and are remarkable also for minute and careful execution. At the same time they are deficient in the repose, simplicity, unity, and breadth which are found to characterize the finest works in sculpture, and which alone can ensure the lasting reputation of productions in this art when the interest that may have been felt in the individual subjects, the fashion of the day, and the popularity of the artist, have passed away. In the absence of these principles we find sufficient reason for the (comparatively) low estimation in which the sculpture of the Rysbrach and Roubiliac schools is now held by all real judges of art.

The most striking defect in the Nightingale monument (to illustrate criticism by reference to a well-known work) is, that the limits which separate poetry and imitative art are transgressed, and the result is confusion and incongruity. The sentiment of a husband endeavouring to shield a beloved wife from the approach of death is just; it appeals to our sympathies, and the mind at once comprehends it; but the attempt to give form to this idea by representing a common-life figure, in modern dress, warding off a palpable and material dart about to be hurled by a grim *skeleton*—making that an agent which is the result or consequence of dissolution—is so obviously wanting in truth and keeping, that it is only necessary to refer to it to show its impropriety. The statue of Newton, though possessing great merits, is open to objections of another kind. The attitude is intended to express thought and calculation, and the action of the hands is finely conceived and perfectly in harmony with this feeling; but the impression is weakened by the general air of the figure, which, critics have justly observed, is not that of a grave philosopher; and the drapery, though executed with great mechanical skill, and with minute attention to correctness of costume, is equally wanting in the repose appropriate to the subject. The sacrifice of simplicity to attitude and flutter, and the ambition to display skill in mere execution—the sure indication of the decline of pure taste—also detract from the general merits of the statues referred to in the monuments of the Duke of Argyle and Bishop Hough. Roubiliac's faults are however the faults of the age; and artists, unfortunately, are too often tempted or driven, against their better judgment, to adopt the mode, however opposed to pure taste or sound principles, by which alone they can expect to gain public notice.

Roubiliac died on the 11th of January, 1762, and was buried in the parish of St. Martin's.

ROUEN, capital of the department of Seine Inférieure, 65 miles in a direct line north-west of Paris, 76 miles by St. Denis, Pontoise, and Magny, or 83 miles by Meulan, Mantes, and Vernon; in 49° 27′ N. lat. and 1° 5′ E. long.

The first mention of this town is by Ptolemy, who speaks of it as the capital of the Veliocasses, a Celtic people. The name is variously written: Rotomagus, Rothomagus, Ratomagus (in the Antonine Itinerary, probably by a transcriber's error, Latomagus); in the Peutinger Table, Rattumagus; and in Ammianus Marcellinus in the plural form, Rotomagi. This name remained when most other capitals had their own proper designation superseded by that of the people to which they respectively belonged, and was in subsequent times shortened into Rotomum or Rodomum, whence the modern Rouen. Under the Romans it was the chief town of the province of Lugdunensis Secunda. Some Roman antiquities, but of little importance, have been discovered at various times. In the early history of France, Rouen appears as the scene of some of the cruelties of Fredegonde. It suffered much from the incursions of the Northmen or Normans, whose capital it became, when, by virtue of the treaty between Rollo and Charles the Simple (A.D. 911 or 912), they settled in this part of France. [NORMANDIE.] Under the dukes of Normandie, it increased on the south side, where ground for building was obtained by contracting the bed of the river. Louis d'Outremer, king of France, visited Rouen, A.D. 943, during the minority of Richard I. of Normandie, of whom he claimed to be guardian. In a subsequent dispute he was captured and imprisoned at Rouen, A.D. 945-6. In A.D. 949, being at war with Richard, he attacked it, but in vain. Guillaume, or William the Conqueror, died at Rouen, or close to it, A.D. 1087. In the year 1204 it was seized, with the rest of the duchy, by Philippe II. Auguste, king of France. The townsmen offered an obstinate resistance to the French, but were at last obliged to open the gates; and their submission determined that of the other towns and forts of the duchy. [NORMANDIE.]

From this time till 1419 it continued subject to the kings of France, under whom it was enlarged on the north and west sides. It was at Rouen that Charles le Mauvais, king of Navarre, was seized by John II, king of France, A.D. 1355. In 1418-19 it was besieged by the English under Henry V. [HENRY V.] The town was defended by a garrison of 4000 men, who were resolutely sustained by the townsmen, under their gallant commander Alain Blanchard. As the town militia mustered 15,000 men, the population of Rouen at the time may be estimated at not less than 50,000 or 60,000. Famine at last compelled the garrison to surrender, and Henry tarnished the fame of his victory by the execution of the gallant Blanchard. Two other citizens who had been excluded from the benefit of the capitulation escaped punishment by payment of money.

Rouen remained for many years in the possession of the English. In 1431 Jeanne d'Arc was burned to death [ARC, JEANNE D'] at Rouen. The Duke of Bedford, regent of France for the English party, died here, A.D. 1435. [BEDFORD, JOHN, DUKE OF.] In 1449 the city was recovered by the French, under the king, Charles VII., in person [CHARLES VII.]; the town was taken in three days; the castle or citadel held out a fortnight longer, and then capitulated. In 1465 Rouen revolted from Louis XI., and took an oath of allegiance to his brother the Duke of Berry, to whom the duchy of Normandie was formally ceded the same year by the peace of Conflans; but it was recovered the next year by Louis, who severely punished some of his brother's chief adherents. In 1562 the Huguenot party succeeded in seizing the town, almost without resistance, and committed great excesses. They were almost immediately besieged by the Royalists, under the Duke of Aumale, whom they repulsed; but the siege was soon renewed by the royal army, at first under Antoine de Bourbon, king of Navarre, who was mortally wounded, and then under the Duke of Guise, who took the town the same year, and gave it up to pillage for eight days. [CHARLES IX.] The massacre of St. Bartholomew extended to this town, but the humanity of the governor somewhat checked the excesses. In 1591 the townsmen who had embraced the party of the League were besieged by Henri IV., but were relieved by the approach of the Duke of Parma, with a Spanish army, from the Low Countries. They did not recognise Henri's title to the crown till after his conversion. Since that period Rouen has few historical events connected with it. Famine led to some troubles in 1789, and the Revolution gave rise to others in 1792, 1793, and 1795; but Rouen suffered less from the excesses of that period than many other towns.

The city stands on the right or north bank of the Seine. Its form approximates to an oval, defined by the boulevards, which form a line of street adorned with trees, and occupying the site of the antient walls, except on the side of the river, where the city is bounded by a line of quays. The boulevards are far less frequented than those of Paris, and 'resemble in appearance, as well as effect, the public walks of Cambridge, except that the addition of females in the fanciful Norman costume, and the Seine and the fine prospect beyond, and Mount St. Catherine above, give it a new interest.' (Dawson Turner's *Tour in Normandy*.) Separated from the city by the boulevards, are the faubourgs or suburbs, viz., the Faubourg Cauchoise, on the west; Bouvreuil, on the north-west; Beauvoisine, on the north; St. Hilaire, on the north-east; Martainville, on the east; and Eauplet, on the south-east. South of the city, from which it is separated by the Seine, is the Faubourg St. Sever, the most important of the suburbs. Opposite the central part of the city the channel of the river is clear; and it was crossed in this part by a floating bridge, supported by nineteen large boats or barges, so as to rise and fall with the tide; but it is now taken away. Just below this may be seen, at low-water, the ruins of a stone bridge, erected in the twelfth century by the empress Matilda or Maud, daughter of Henry I. of England, and carried away by a flood, A.D. 1564. Opposite to the upper and lower parts of the city and suburbs are two long islands: the upper called 'Ile de la Croix or de la Mouque;' the lower, the 'Ile du Petit Gay.' At the western or lower end of the Ile de la Croix, a stone bridge crosses the river; it is divided into two parts by the point of the island, resembling in this respect the Pont Neuf at Paris. Each part has three arches, the centre one of more than 100 feet span, the side arches of 85 feet. On the point of the island between the two parts of the bridge is a circular area adorned with a column. This bridge was begun by Napoleon, but has been finished since his reign. Two small rivers, the Robec and the Aubette or Prefontaine, flowing from the east-north-east, traverse the eastern part of the suburbs and city by artificial channels, formed by the Cardinal Georges d'Amboise, archbishop of Rouen, and flow into the Seine, the Aubette above and the Robec just below the stone bridge. Another little stream flows from the north in a covered channel, and falls into the Seine some distance lower down. On the east side of the city, just above the bank of the Seine, between that river and the Aubette, rises the hill or mount of St. Catherine, a bold eminence 380 feet high, which presents to the city a steep side of bare chalk, except where spotted with patches of vegetation or with cottages. On the south bank of the Seine, along which it extends for about a mile eastward of the bridges, is the principal public walk, 'Le Grand Cours,' planted with four rows of fine elms.

The interior of the city is very disagreeable, more particularly in the eastern part. An English traveller thus describes it in 1818: 'The filth is extreme; villanous smells overcome you in every quarter and from every quarter. The streets are gloomy, narrow, and crooked; and the houses at once mean and lofty. Even on the quay, where all the activity of commerce is visible, and where the outward signs of opulence might be expected, there is nothing to fulfil the expectation. Here is width and space, but no trottoir; and the buildings are as incongruous as can well be imagined, whether as to height, colour, projection, or material. Most of them, and indeed most in the city, are merely of lath and plaster, the timbers uncovered and painted red or black, the plaster frequently coated with small grey slates laid one over another like the weather-tiles in Sussex. Their general form is very tall, and very narrow, which adds to the singularity of their appearance; but mixed with these are others of white brick or stone, and really handsome, or it might be said elegant. The contrast however which they form only makes their neighbours look the more shabby, while they themselves derive from their association an air of meanness.' (Dawson Turner's *Tour.*) The frequent rains, by cleansing the streets, render the town less unhealthy than it would be; and beneficial changes introduced of late years have contributed to the same result. But the lank figures and pale faces of the inhabitants of the eastern part of the city show that much remains to be done. On the western side of the city and suburbs are some handsome straight streets lined with good stone houses. The squares and other open spaces are numerous, but for the most part very irregularly laid out; the 'Champ de Mars,' adjacent to the eastern boulevards, and the 'Place du Boulingrin,' used for the cattle and horse rket, adjacent to the northern boulevards, are of more regular form. The Place St. Ouen, or Place de l'Hôtel de Ville, is large, and planted with trees.

The cathedral, the most remarkable building in Rouen, is a noble and spacious edifice, superior perhaps as a whole to most or all of the French cathedrals. It is a cruciform building, with two towers at the extremities of the west front, and a lofty tower and spire from the intersection of the nave and the transepts. The dimensions are given in French feet as follows:—length of the interior, 408 feet; width of ditto, 83; length of nave, 210; width of ditto, 27; width of aisles, 15; length of choir, 110; width of ditto, 35½; length of transept, 164; width of ditto, 25½; length of Lady-chapel, 88; width of ditto, 28; height of spire, 380; ditto of western towers, 230; ditto of nave, 84; ditto of aisles and chapels, 42; ditto of interior of central tower, 152; depth of ls, 10. (The French foot is to the English in the proportion of 65 to 61, or nearly as 16 to 15.)

The general character of the architecture is what is termed by Rickman 'Early English.' The changes which mark the different epochs in the progress of Gothic architecture were introduced into Normandie earlier than into England. The west front, which opens upon a spacious close, is about 170 feet wide; the towers by which it is flanked are of dissimilar architecture, though of nearly equal height. The spire which surmounts the central tower, and appears over the centre of the west front, is of bold and light construction. The summit of the west front is crowned by a range of open screens, with the lightest and most elegant tracery. There are three doorways 'deep in retiring mouldings:' the central one, which is by far the largest, 'projects like a porch before the others, and is surmounted by a gorgeous pyramidal canopy of open stone-work, in whose centre is a great dial, the top of which partly conceals the rose window behind. This porch is adorned with numerous statues in niches, and was begun by the archbishop Georges d'Amboise, A.D. 1509. The side doorways are obtusely pointed, and are much older. The western towers flank the church so as to leave three sides free, and thus conduce to the great extension of the west front. The northernmost of these towers, called the tower of St. Romain or Romanus, is one of the oldest portions of the church; it has circular windows looking into the cloister court (the cloisters are nearly all destroyed), which are perhaps of the eleventh century. The southernmost of the towers is of very rich pointed architecture, and was built at a much later period by archbishop Georges d'Amboise. A great bell, 33,000 lbs. weight, cast by order of the same prelate and named after him, hung in this tower; it was of very inferior tone, and, after being cracked in 1786, was melted down at the time of the Revolution, and cast into cannon. The doorway in the northern transept, called the 'Portal of St. Romain,' is adorned with an endless variety of fanciful sculptures. The end of the northern transept is flanked by towers, and in the centre is a magnificent rose window. The southern transept bears a general resemblance to the northern, but has suffered more from the violence of the Huguenots and the Revolutionists. The central tower is of the year 1200; it is low and comparatively plain; the spire, the fourth by which it has been surmounted, was erected in 1824, in place of the former one destroyed by lightning: it is described as being much more elegant than its predecessor, which, though not elegant, was remarkable for the boldness of its architecture. The first spire was of stone, the second and third, and, we believe, the present one, of wood. The Lady-chapel and the roof of the choir were finished in the sixteenth century.

The interior of the cathedral contains twenty-five chapels, and many interesting monuments, including those of Rollo and his son Guillaume or William I. (Longue Epée), dukes of Normandie; but the effigies of these princes are of later date than their time. The tombs or cenotaphs of Henry the younger, son of Henry II.; of his brother Richard Cœur de Lion (whose heart was buried here); of Charles V. of France; of John, duke of Bedford; and others of interest, have been destroyed, partly by the religious and political troubles of subsequent ages, partly to make way for repairs and alterations in the building. The library was plundered during the Revolution; the staircase of the room which contained it is remarkable for its delicacy and beauty. The extensive palace of the archbishop, adjoining the cathedral, contains some good paintings.

The abbey church of St. Ouen is the noblest edifice in the pointed Gothic style in the city, and perhaps in France. Its beauty caused it to be preserved in the general destruction of the conventual churches at the Revolution, though it did not escape being plundered and desecrated. It had suffered much from the hands of the Huguenots in 1562. The abbey to which it was attached was founded in the sixth century, if not earlier; and the first church was dedicated to the twelve apostles, but afterwards transferred to the patronage of St. Ouen. The church was rebuilt in the twelfth century, but a fire having destroyed it and the rest of the abbey, except one tower, attached still to the present church, it was again rebuilt in the fourteenth and following centuries. It is a cruciform building, with a central tower, and two western towers, which jut out diagonally from the angles of the western front, and were intended to be connected by a porch of three arches, extending along the lower story of the western front: the towers have been raised only to about fifty feet, and are imperfect. The lightness and purity of the architecture; the flying buttresses, with crocketed pinnacles and unusually lofty shafts; the beautiful south porch; the large rose or circular windows; the balustrade of varied quatrefoils round both the body of the church and the aisles; the painted windows, the whole of which have been preserved; and the rich central tower, terminated by a smaller octagonal tower, entitle this church to the highest admiration. Its dimensions are as follows: they are little inferior to those of the cathedral itself, and in some respects surpass it:—Length of the church, 416 French feet; of the nave, 234; of the choir, 108; of the Lady-chapel, 66; of the transept, 130; width of the transept, 34; of nave without aisles, 34; of nave with aisles, 78; height of roof, 100; of tower, 240.

The church of St. Maclou is next in beauty to the cathedral and the church of St. Ouen. The churches of St. Paul and St. Gervais, insignificant in themselves, show some remains of the Norman style. Those of St. Patrice and St. Godard are in a vitiated intermediate style between Gothic and Roman. There are in all fourteen Catholic (six of them parish) churches, several of Roman architecture. There are also a Protestant consistorial church and a Jews' synagogue.

The Palais de Justice, or court-house, built in the 15th or 16th century for the parliament of Rouen, forms three sides of a quadrangle, of which the fourth side consists of an embattled wall and a gateway of elaborate architecture. It is, notwithstanding many faults, a fine specimen of Gothic architecture of a late period, in a style approximating to what in England is sometimes called the Tudor style. Several of the apartments are admirable for their noble dimensions, just proportions, or carved and ornamented walls and roofs. In the Place de la Pucelle is a house, l'Hôtel Folleville, of similar architecture to the Palais de Justice, but far richer. It is ornamented with bas-reliefs or tablets, one series representing the interview of Henry VIII. and François I. in the Field of the Cloth of Gold. There are a town-hall, formerly an abbey, a clock-tower, and several other Gothic buildings of less interest and importance: there are some remains of the antient castle, and a very few fragments of the town wall. The Caserne Martainville, or barrack of Martainville, in the square of the Champ de Mars, has an imposing front; the Hôtel Dieu, or great hospital, is spacious and airy; and the 'Halles,' or covered markets, are considered to be among the finest in France. They surround on three sides one of the public squares, and form several conveniently arranged and extensive apartments. The Mercery Hall, or Halle des Rouenneries, is 272 French or 290 English feet long by 50 French or 53 English feet wide; the corn-market is 300 French or 320 English feet long. A considerable number of fountains are distributed through the streets and squares of the city, two are Gothic, and of better architecture than the rest; the fountain of La Croix de Pierre resembles the crosses erected by our own Edward I. to the memory of his queen Eleanor; that of La Crosse is of smaller size and more recent date. The fountain of La Place de la Pucelle consists of a plain triangular pedestal, with dolphins at the base, surmounted by a statue of Jeanne d'Arc in military costume; it marks the place of her execution. There are mineral springs in two places: those of La Marquerie are resorted to by a number of people; they are chalybeate. La Bourse, or the Exchange, sometimes called La Bourse-à-couvert, from its being used only in unfavourable weather, the merchants at other times meeting in an uncovered enclosure adjacent to it, is a fine building on the quay.

The population of Rouen, in 1826, was estimated at 90.000; in 1831 it was 88,086; in 1836, 92,083. Rouen ranks next to Lyon among the manufacturing towns of France; it is the principal seat of their cotton-manufacture. Cotton-yarn is spun, but not the finest sorts. In fact, the manufactures of Rouen are chiefly designed to meet the wants of the middling and humbler classes. The spinning-machines are worked by manual labour, by horses, by water, or by steam. Weaving is actively carried on, and one class of the productions of the town is known by the name of *Rouenneries*, or Rouen goods; it comprehends chiefly checked and striped cottons for women's dresses, distinguishable usually by certain predominant colours, violet, lilac, rose, and more commonly red. Since 1810 the manufacture of nankeens has been introduced and carried to a great extent. Dupin, in 1827, estimated the quantity made yearly at 600,000 pieces, of 4½ mètres, or about 5 yards each. They are carefully made up to imitate the India nankeens, under which character they are sold. Kerseymeres are manufactured from dyed wool mingled with white cotton, so as to produce the shade of colour required. Dyeing cottons with Turkey and Indian red, dyeing woollens, calico-printing, and bleaching by chemical processes are carried on to a considerable extent. To the above manufactures may be added dimities, muslins, lace, bed-ticking, woollen hosiery, silk and cotton velvet, fabrics of mingled silk and cotton. From the increasing demand for labour, many of the Rouen manufacturers have been induced to send their raw materials into the departments of Somme, Pas de Calais, Aisne, and Nord, to be manufactured there. The products of the looms of Rouen are sent chiefly to the central parts of France. Paris, Lyon, Limoges, Bordeaux, Toulouse, and Marseille are the principal marts to which they are transmitted: from Lyon, Toulouse, and Marseille they are exported to Germany, Italy, and the Levant.

Besides the woven fabrics, confectionary of high repute, especially apple-sugar and apple-jelly, cards, pasteboard, paper-hangings, toys, hats, pottery, cards and combs, leather, glue, catgut, colours, chemical products, neat's-foot and seed oils, soap, brass wire, copper sheathing, small shot, sheet lead, and pitch are made. The western part of the city is the mercantile part; the centre is chiefly occupied by retail traders; and the eastern part is inhabited by the manufacturing population. The Faubourg St. Sever is also occupied by persons engaged in manufacture. In the northern part of the town, and in the Faubourg Cauchoise, on the western side, the gentry and persons not engaged in business chiefly reside. Ship-building is carried on along the bank of the Seine.

The river forms a commodious port, divided by the stone bridge into two parts; the upper devoted to the large boats which convey goods to Paris and other places higher up the river, the lower part to sea-borne vessels. The direct distance of Rouen from the sea is about forty-five miles, but the length of the navigation is almost twice that distance. The influence of the tide is sensibly felt at Rouen; and vessels of 250 or 300 tons can get up to the town. The ready communication of Rouen with the capital and with other towns, either by the navigation of the Seine, or by the roads, which are very good, has made it a place of considerable trade, independently of its manufacturing industry. The articles of trade are wine, brandy, cider, corn, fruits, &c. There are six fairs in the year, two of them of fifteen days each.

Rouen, besides being the capital of the department, and of an arrondissement, is the seat of an archbishopric, of a Cour Royale, of an Académie Universitaire, and of the head-quarters of the fourteenth military division. The archbishopric is of great antiquity: the diocese comprehends the department of Seine Inférieure; the archbishop has for his suffragans the bishops of Bayeux, Evreux, Séez, and Coutances, whose dioceses comprehend the departments formed out of the antient province of Normandie. The Cour Royale and the Académie Universitaire have jurisdiction over the departments of Eure and Seine Inférieure, and the fourteenth military division includes the departments of Seine Inférieure, Eure, Manche, Calvados, and Orne. Government offices, administrative, fiscal, or judicial, are numerous; they include, with others, a Cour Royale, a tribunal of commerce, a subordinate justiciary court, a mint, and a custom-house. The churches and other places of worship have been enumerated. There are two seminaries for the priesthood, a faculty of theology, a school of medicine, a royal college or school, with cabinets or museums of natural history and natural philosophy, schools of drawing, painting, and navigation, and forty elementary schools. There are two public libraries, one of them, which is deposited in the town-hall, was estimated several years since to contain 70,000 vols. and 800 MSS.: a gallery of paintings, some of them very good, also established in the town-hall; an excellent botanical garden, with much admired hothouses; a royal academy of science, literature, and art; societies of commerce, agriculture, medicine, pharmacy, a central society of agriculture, and a commission of antiquities. Among the charitable institutions are four hospitals, including one for the insane, and one for foundlings; a savings'-bank, and a Protestant Bible Society. There are, besides these institutions, a prison (the Bicêtre), comprehending three departments; three ranges of barracks, well kept public baths, and two theatres.

Rouen was the birth-place of Corneille, his brother Thomas Corneille, Fontenelle, the Jesuit Sanadon, Po-chart, Jacques Basnage, the painter Jouvenet, and the architect Blondel.

The arrondissement of Rouen has an area of 502 square miles, and comprehends 155 communes; it is divided into fifteen cantons or districts, each under a justice of the peace. The population in 1831 was 225,996; in 1836 it was 238,805.

ROUERGUE, a province in France, forming the eastern extremity of the military government of Guienne: it was bounded on the north by Auvergne; on the north-east by Gevaudan, a portion of Languedoc; on the east by the district of the Cévennes, also in Languedoc; on the south-east, south, and south-west by other portions of Languedoc; and on the west by Quercy, which, like Rouergue, was a part of Guienne. It was of considerable size, extending about ninety miles from the Cévennes in the east, to the town of St. Antonin on the Aveyron in the west; and seventy-eight or eighty miles from north to south. Its capital was Rhodez [RHODEZ], pop. in 1831, 8249; in 1836, 9685; and the other chief towns were Milhaud or Milhau [MILHAU], pop. in 1831, 9806; St. Affrique [AVEYRON], pop. in 1831, 6336; in 1836, 6421; and Villefranche [VILLEFRANCHE], pop. in 1831, 9540; in 1836, 8738. The population given is for the whole commune. The department of Aveyron comprehends nearly the whole of the province of Rouergue; the physical features are described in the article AVEYRON. Rouergue was subdivided into Le Comté (de Rhodez?) in the north, chief town Rhodez; La Haute Marche in the east and south, chief town Milhaud; and La Basse Marche in the west, chief town Villefranche.

Rouergue derives its name from the Ruteni, a Celtic people who inhabited it. A few Celtic or Roman towns are known to have been within its limits: as Segodunum, afterwards Ruteni, now Rhodez; Carentomagus, near Villefranche; and Condatomagus, somewhere on the south-eastern border, near the Cévennes. On the downfal of the Roman empire this part of France underwent various changes, the possession of it being contested by the Visigoths, Franks, and the Ostrogoths of Italy, under their king Theodoric. It was afterwards incorporated with the duchy of Aquitaine. [GUYENNE.] From the time of Charlemagne it was governed by counts of its own, who were a branch of the same family as the counts of Toulouse; their power was very considerable. The county was afterwards united to the dominions of the counts of Toulouse. [LANGUEDOC.] The county of Rodez, which comprehended about a third part of Rouergue, was held by a line of nobles, vassals of the counts of Toulouse; it was united early in the fourteenth century to the county of Armagnac. It was seized by Louis XI., and reunited to the crown about A.D. 1470.

ROUFFACH. [RHIN, HAUT.]

ROULERS, or **ROUSSELAER**, is situated in the province of West Flanders, in the kingdom of Belgium, on the Mandel, a small river which falls into the Lys. The chief occupation of the inhabitants is the linen manufacture and bleaching of linen: there are some sugar-refineries, and many persons are employed in the cultivation of flax in the adjacent country. The pasture-land in the vicinity is rich, and the breed of cattle is very fine. A considerable quantity of butter is exported. The number of inhabitants is about 9000. Roulers is eighteen miles south of Bruges. (Hörschelmann; Hassel; Stein.)

ROULOUL, the name of a bird whose position in the system has occasioned some difference of opinion among ornithologists.

Gmelin placed it among the pigeons, Sparrman among t pheasants, and Latham (the female) among the *Tetra-* c r. The form has been elevated to the rank of a genus uer the names of *Cryptonyx*, Temm., and *Liponyx*, v ieill.

Cuvier arranges it between the pheasants and the great genus *Tetrao*, Linn.

Mr. Vigors observes that the groups which compose the *Tetraonidæ* are chiefly distinguished in modern systems from those of the *Phasianidæ* by their more simple appearance; by the absence, in fact, of those ornaments to the plumage, and those naked or carunculated appendages to the cheeks and head, so conspicuous in the latter family, but which are reduced in the *Tetraonidæ* to the mere space that encircles the eye. The still weaker conformation of the ıd toe, he remarks, tends further to separate them. In ue *Tetraonidæ* this member becomes shorter and gradually weaker, until it is completely lost in some of the groups. In this point of view he considers that the *Tetraonidæ* hold an intermediate station between the *Phasianidæ*, where the hind toe, although articulated high on the *tarsus*, is yet comparatively strong, and the *Struthionidæ*, where it is generally if not always deficient; and he is of opinion that the groups which compose the *Tetraonidæ*, corresponding with those which form the genus *Tetrao* of Linnæus, seem to be immediately united to the preceding family (*Phasianidæ*) by means of *Cryptonyx*, which resembles them in the similar appendage to the plumage of the head. This group, he adds, leads directly to *Coturnix*, Briss., and the true *Perdix*, where it has indeed been generally arranged, and from which it has been chiefly separated by the defalcation of a nail to the hinder toe. (*On the Natural Affinities that connect the Orders and Families of Birds*, in *Linn. Trans.*, vol. xiv.)

M. Lesson arranges the form as the first genus of the family *Tetraonidæ*, a position which it occupies in Mr. Swainson's method.

Mr. G. R. Gray (*List of the Genera of Birds*) places it in the subfamily *Perdicinæ*, between the genera *Ptilopachus*, Sw., and *Ortyx*, Stephens.

Generic Character.—Bill strong, stout, compressed, convex above, curved towards the point; nostrils longitudinal, placed in the middle of the bill, and covered by a naked membrane; orbits and lore naked; hind toe without any nail, not touching the ground; wings short; third, fourth, and fifth quills longest.

Geographical Distribution of the Genus.—India and its islands.

M. Lesson states that only one species is known; but Mr. Swainson says that three or four species have been recently described—*Cryptonyx niger*, for instance.

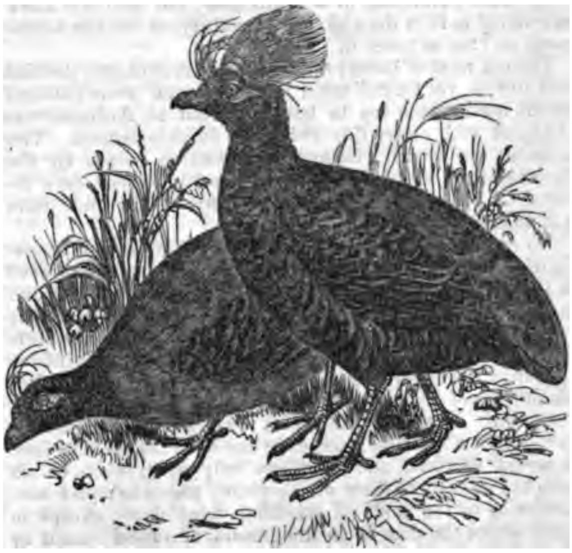
Example, *Cryptonyx cristatus* (*Cryptonyx coronatus*, Temm.).

This is the *Rouloul de Malacca* of Sonnerat. According to Mr. T. C. Eyton, the Malay native name is *Bestum*. (*Catalogue of a Collection of Birds from Malaya*, &c., in *Zool. Proc.*, 1839.)

Description.—Male.—On the front a few long and floating hair-like appendages. A thick crest directed backwards covers the occiput: at its origin it is pure white, and then becomes fire-red. Forehead and upper parts of the neck blackish-blue, on which the red patch round the eye and that of the commissure of the bill are well defined. Upper part of the body emerald-green, lower part rich azure-blue; wings ruddy-brown; bill lead-colour; and feet flesh-colour. Tail short and but little visible, its feathers black. Length about ten inches.

Female.—No crest, but only the isolated hair-like appendages of the forehead. Head and neck deep brown: the whole body uniform grass-green. Wings ruddy-brown, waved with brown.

Locality and Habits.—These beautiful birds haunt the great forests of Malaya, Sumatra, and Java. Wild and shy, they avoid the face of man, and are kept in captivity with great difficulty.



Cryptonyx cristatus. Male in the front; female behind.

ROUND (*rotundus*, from *rota*, a wheel) is a term which is indiscriminately applied in common language to everything which has no very sharp corners. A cylinder and a sphere, a wheel and a ball, are equally styled round. In geometry the sphere, cylinder, and cone, are sometimes denominated the three round bodies, and it would certainly add much to many persons' power of describing shapes if they would learn the meaning of the terms circular, cylindrical, conical, spherical, spheroidal, and annular, for all of which the term round is employed without any distinction.

ROUND, a short vocal composition in three or more parts, in the performance of which the first voice begins alone, singing to the end of the first part, then passes on to the second, and afterwards to the third, &c., the other voices following successively the same routine, till all are joined together, the round ending at the mark of a pause (𝄐) or at a signal agreed on. This is frequently, but most erroneously, called a *catch*, and sometimes, not less incorrectly, a 'Canon in the unison.'

ROUND TOWER. Numerous lofty towers, tapering from the base to a conical cap or roof, which crowns the summit, are found in Ireland, and are almost peculiar to that country. That they are of great antiquity appears from their having been considered antient even in the twelfth century, when the British connection with Ireland began. Had they been then in actual use, it is not probable that so accurate a writer as Giraldus Cambrensis, who had been in Ireland, and circumstantially describes them, should not also have mentioned to what purpose they were applied.

There are 107 of these towers, or of the sites where they once stood, now known, and there is reason to believe they were formerly more numerous. Some of them are still perfect, and preserve their conical roofs; but only one, the tower of Devenish, possesses the singular ornament of an obtuse crescent rising from the cone, and somewhat resembling what is called the trident of Seeva.

Ardmore tower, near Waterford, had also, within the memory of man, this finishing ornament. In the other towers, the conical caps are either more or less injured, or have altogether vanished. Some few are topped by battlements, but all these appear to be of more modern construction than the towers, except Kilree, in the county of Kilkenny, which seems to have been built originally with a battlement; but as the stone roof is completely destroyed, there can be no certainty upon this point.

The battlement on Tullsherin tower, in the same county, as well as the uppermost fifteen feet of the tower, is built in the early dove-tail style of masonry, of which the comparatively modern church in the same churchyard is built, and with precisely the same pattern of battlement, while the remainder of the tower is constructed of hammered stone, in the most perfect manner, each stone being an accurate segment of the circular courses of the building.

This low-browed church of Tullsherin was built by St. Kieran, early in the sixth century, at which time the masonic art was in a very degraded state, when compared with that which is shown in the erection of the tower. Kildare tower also terminates in a battlement, but that we know was added to it in the eighteenth century, as was the battlement on Cloyne tower in 1749.

Though most of these round towers were evidently divided into stories, yet Cashel tower is smooth, and even polished on the inside from top to bottom. That at Ardmore was plastered with a very fine white and durable cement. The divisions are usually formed by projecting ledges for the flooring joists, which however in some instances were inserted in square holes in the wall, where the ends were still visible not many years ago.

On each floor there is one very small window, and immediately below the conical cap four windows may be traced in the greater number of towers; in one there are five and in a few six windows; and so many as eight appear in one or two of the towers, but this is the largest number hitherto observed. In three or four of these buildings no windows appear in the upper story—only one small loop-hole—a convincing proof that they could not have been intended for campanili. In most of the towers the doors are at a considerable height above the ground, in one even twenty-four feet, in several fourteen, and in others only eight, seven, or six feet, but in none of them are there any traces to assist conjecture as to the mode of reaching those doors, except in those where the door is on the ground, or raised from it by a couple of steps.

The height of these towers varies greatly, one being only thirty-five feet, while the loftiest is one hundred and twenty, but the common range is between eighty and a hundred feet. Some stand on circular bases, which form one or two deep steps round the tower. Thus Donoughmore has a two-step base, each step or plinth being composed of very large blocks of stone. The basement of Kell's tower is square, and the stones are of great size. Kilree and Aghaviller, both in the county of Kilkenny, have circular plinths fourteen inches deep, projecting six inches, and resting upon a square base formed of great blocks of stone.

The tower of Clondalkin, about five miles from Dublin, stands on massive stone-work; and St. Columb's tower, at Londonderry, rises from a vaulted crypt. So also does that at Oughterard, in the county of Kilkenny.

In external character all the towers may be said to agree, since there is only one which does not taper, and in that case the tower is cylindrical throughout its entire height. It is nicely faced, inside and out, with coggle-stones, and filled up with rubble.

Though all bear to each other the strongest family likeness, there are many striking differences in the mason-work and in the minor details.

The stones in some are truly chiselled, and closely beautifully laid in fine cement. Some are only coarsely hammered, others merely faced, and of various shapes and sizes, but still well fitted to each other. Some towers are built of round coggle-stones. In all the mortar is as hard as the imbedded stones.

The above and various other little diversities prove these remarkable structures were erected by various workmen and at divers times, and, as Giraldus Cambrensis [illegible] 'according to the manner of the country;' but this implies that the æra of their erection must [illegible] prevailed through a very long period.

Their situation on hill or dale is equally variable, nor any one circumstance respecting their situations se[illegible] common to all, except their immediate vicinity to a small and very antient church, though in some [illegible] antient building has been replaced by a more [illegible] fabric.

It is a well known fact that the early missionaries chose the sites of Pagan places of worship for their [illegible] but it is not equally well known that the undoubted [illegible] of Pagan places of worship remain in close association [illegible] these towers, and even in the same churchyard; the [illegible] stone of witness, the tapering sun-stone, the crombec, fire-house, and the holy spring of sacred water ne[illegible] the mystic rites, all these are found along with [illegible] tower and the little antient church within the same narrow [illegible]dary.

The speculations of antiquaries as to the obje[illegible] [illegible]ing these mysterious towers have indeed been [illegible] penitentiaries, the abode of anchorites, beacon-towers, a[illegible] posts, places of safety for goods, sepulchral stelæ, [illegible] towers, &c. All these theories have been nearly [illegible] rest, and opinion seems now to vibrate between their [illegible] trumpet-towers, from whence, by means of the great trumpet, the people were invited to worship; or fire-towers where the sacred fires of Bel or Baal, who was undoubt[illegible] worshipped in Ireland and Scotland, were kept alive, [illegible] tower itself being an emblem of the sun-beam or ray [illegible] heavenly fire.

A third idea indeed has been lately suggested by [illegible] scholars, that they are Buddhic in their origin, and sepulchral in their immediate application, and that they have [illegible] erected over the bones or relics of saints.

Before closing this article, it should be mentioned [illegible] though these towers are almost peculiar to Ireland, [illegible] are two in Scotland, but in that district which, [illegible] the very early ages, was in close and constant connection [illegible]land.

In other parts of the world, as Andalusia, the Ca[illegible] Persia, and part of India, towers of all sizes and shapes in various situations, have been discovered. As in all there are some points of resemblance, they may all [illegible] prove to be successive links of that long chain of [illegible] by which these mysterious buildings may be traced [illegible]wards from their origin to the pagan rites of the [illegible] Irish.

ROUNDHEADS, a name given to the republi[illegible] England, at the end of the reign of Charles I

Commonwealth. The name seems to have been first applied to the Puritans because they wore their hair cut close, but to have been afterwards extended to the whole republican party. The Cavaliers, or royal party, wore their hair in long ringlets. [CAVALIER.]

ROUSSEAU, JEAN BAPTISTE, was born in Paris, April 6, 1670. His father, who was a shoemaker, furnished him with a liberal education. In 1688 he attended the French ambassador to the court of Denmark, and afterwards came to England with Marshal Tallard. On his return to Paris he devoted himself to poetry. His first productions consisted chiefly of satirical epigrams, most of which were pointed against contemporary writers. He thus created a number of enemies, and laid the foundation of that spirit of persecution which afterwards drove him from his native land. In 1694 his first comedy, 'Le Café,' was performed, with little success. This was followed, in 1696, by the opera of 'Jason, ou la Toison d'Or,' and, in 1697, by that of 'Venus and Adonis,' both of which were even more unsuccessful than his first comedy. His next dramatic effort was the comedy of 'Le Flatteur,' which was brought out at the Théâtre Français, and was received with considerable applause, but did not command more than ten representations. It was then in prose, but he afterwards put it into verse. He finished his dramatic career about four years afterwards with the comedy of 'Le Capricieux,' which met with an unequivocal condemnation, while Danchet's opera of 'Hesione,' which was brought out at the same time, was brilliantly successful. For some time previous to this, the Café Laurent, in the Rue Dauphine, had been and still continued to be frequented by La Motte, Saurin (Joseph), T. Corneille, Crebino, Boindin, Rousseau, and other literary men; and Rousseau, who seems to have thought that a cabal had been ormed among them to ruin his piece and exalt the other, vent to his disappointed feelings in a satirical parody ome couplets of the prologue to 'Hesione.' The parody nsisted of five couplets, confessedly by Rousseau, but they re followed by others still more calumnious, which were ed at the frequenters of the Café Laurent, and these re also attributed to him by La Motte, Saurin, and ers, who belonged to an opposite literary party. To this rge he made no other reply than that of stating to his nds that they were not written by him; but withdrew self from the meetings at the Café; and there, for the sent, the matter ended.

n 1703 we find Rousseau living in Paris with M. Rouillé, ector of the finances, by whom he was taken to court, and roduced to the first society. About this time he began to te his 'Sacred Odes,' in accordance with the solemn piety, l or affected, which Louis XIV. had rendered fashion- e at his court during the latter years of his reign. He harged with composing licentious epigrams at the same ne, to suit the taste of another class of his acquaintance. was said to be

> 'Pétrone à la ville,
> David à la cour.'

In 1710 the place left vacant by T. Corneille in the Aca- mie Française was contended for by La Motte and Rous- au, and obtained by the former. The approaching death Boileau however was expected soon to occasion another cancy, and also to leave at the disposal of the court the nsion which he had enjoyed, and which could only be be- owed upon an academician. Rousseau expected to fill e vacancy, and also aspired to the pension; La Motte, wever, prepared to contend with him for the latter. Such s the state of the two literary parties which then divided aris, La Motte and Saurin being leaders of the one, and seau of the other, when a new series of couplets made appearance, more calumnious and indecent than the r, in which the frequenters of the Café Laurent, and ecially La Motte, were attacked. These couplets were nediately attributed to Rousseau by his enemies; but he ignantly disavowed them; and having discovered the n who dropped them about the streets, and drawn from a confession that they were given to him by Saurin, he ged that gentleman before a court of law with having en them, but failed in establishing his charge by legal oof. Finding that he was now placed in a dangerous ion, he withdrew to Switzerland; and on the 7th of 1712, an arrêt of parliament, given 'par contumace,' emned him to perpetual banishment from France. eau denied to the last that he had anything to do with couplets; and Boindin, to whom they were addressed, and who was much abused in them, always refused to believe that they were Rousseau's, and left a memoir, which was published after his death (Brussels, 1752, 12mo.), in which he accuses Saurin, La Motte, and a jeweller of Paris, of being the authors of them.

From this time Rousseau's life was passed in various countries of Europe. The Comte de Luc, the French ambassador to Switzerland, received him under his protection, and admitted him to an intimacy which was only terminated by the death of that nobleman in 1740. Rousseau accompanied De Luc to Baden in 1714, where he became known to Prince Eugene, who also took him under his patronage; and in 1715, when the Comte was appointed ambassador to Vienna, Rousseau went with him to that city, where he remained three years.

Rousseau had left powerful friends in Paris, among whom the Baron de Breteuil exerted himself with so much success as to obtain for him letters of recall, which were forwarded to him in February, 1716; but Rousseau refused to avail himself of them, on the ground that they were granted to him as an act of grace, whereas he required a public acknowledgment of the injustice of his sentence. In 1720 he went to Brussels, where he became acquainted with Voltaire, and they were very friendly for some time, but afterwards became bitter enemies. In 1721 he came to England, where he published a new edition of his works (1723, 2 vols. 4to.) which produced him about 2000*l.* This sum he unfortunately invested with the Ostend Company, which failed, and he again became dependent on his friends for support. He now returned to Brussels, and was received under the protection of the Duke d'Aremberg, who, when he quitted Brussels in 1733, settled a pension upon him.

In 1738 Rousseau became desirous of returning to France, and made interest to procure the same letters of recall which, more than twenty years before, he had indignantly rejected, but he could not obtain them. He however ventured to visit Paris *incognito;* but though the authorities shut their eyes to this infraction of the law, they gave him no hope of being recalled. After remaining a few months in Paris, he returned to Brussels, where he died, March 17, 1741.

The first collected edition of his works was published by himself, after his banishment, at Soleure, in Switzerland; the next was that of London, 2 vols. 4to., 1723, which was reprinted at Paris in 1743, and was again reprinted at Paris in 1757, with a 5th volume, containing the licentious epigrams, many of which were no doubt properly ascribed to him, and also the notorious couplets, engraved in imitation of the hand in which they were written. The most complete edition of his works (not including the licentious epigrams) was published at Brussels in 1743, under the superintendence of M. Seguy, 3 vols. large 4to., with the author's last corrections. It consists of his poems, his dramatic pieces, and a collection of his letters. There is a beautiful edition of his works, 5 vols. 8vo., Paris, Lefèvre, 1820. There are several other editions.

Jean Baptiste Rousseau stands indisputably at the head of the lyric poets of France. His poems consist of—'Odes Sacrées,' 1 book; 'Odes,' 3 books; 'Cantates,' 1 book; 'Epîtres,' 2 books; 'Allégories,' 2 books; 'Epigrammes,' 3 books; and 'Poésies Diverses,' 1 book. Rousseau's dramatic pieces, as may be inferred from the manner in which they were received by the public, are of little value. His epistles, allegories, and miscellaneous poems are perhaps not much inferior to Boileau in strong sense and elegance of versification, but are inferior to him in wit. His epigrams are neat and sparkling, and the satire is directed to its mark with an aim that seldom fails. His fame however rests upon his odes and his cantatas. His sacred odes are free imitations of the Psalms of David, not so close as translation nor so wide as paraphrase. Too many of his other odes are addressed to kings, ministers, and generals, and relate to events of temporary interest. His best odes however are distinguished by boldness and justness of thought; by simplicity of expression, by fullness and distinctness of imagery, without being overloaded with it; by an earnestness and enthusiasm which seem to spring spontaneously from the feelings of the poet; and by a splendour and harmonious richness of diction in which he seems to have no rival among French poets. His cantatas are a species of ode of which part is adapted for recitation and part for singing. They are beautiful compositions. Some of them may be said to approach the sublime, if they do not reach it;

l the council of Geneva had it burnt by [illegible] The publication of his 'Con- s took place soon after, added to the out- in consequence of which Rousseau left l first to Yverdun, but the senate of Bern nt the territory of the republic. He then l, of which Marshal Keith was governor Prussia. Keith received him kindly, and p his residence at Motiers in the Val de he wrote a reply to the archbishop of to the magistrates of Geneva, in which [illegible] citizenship. In his retirement he wrote s de la Montagne,' being a series of stric- the civil and ecclesiastical government of was. This work increased the irritation r, a feeling which spread even among the rs, who [illegible] their eccentric visitor in h however the suspicious temper of Rous- [illegible]. He removed to the little island he Lake of Bienne, where he assumed, w, the Armenian costume. Being sent by an order from the senate of Bern, he invitation of David Hume, who offered m in England. Rousseau arrived in Lon- [illegible], and the following March went to shire, where Hume had procured him a in the house of Mr. Davenport. It was that Rousseau quarrelled both with [illegible] returned to France. A d in the newspapers bearing the name of a, and reflecting severely upon Rous- mities. Rousseau accused Hume of be- planner of the [illegible] communication. e protest that he knew nothing of the Horace Walpole [illegible] himself the [illegible] letter. Rousseau however would [illegible] to charge Hume with the against him. The correspondence that e parties has been [illegible] in the com- Rousseau's works. Rousseau afterwards acknowledged that during his residence in een subject to fits of insanity.

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[illegible]

[illegible] canto [illegible])

[illegible] grievances was that he thought [illegible] had imposed restrictions upon his [illegible] friends applied to the duke of Choi- [illegible]. The duke's answer, dated 1772, is as I have advised M. Rousseau not to pub- [illegible] my previous knowledge, of which fact [illegible] it could only have been with a [illegible] from fresh squabbles and annoyances. As [illegible] no longer the power of protecting him [illegible] his premiership, I fully acquit [illegible]

ew old and infirm, the labour of copying irksome, and all his income consisted of an annuity of 1450 livres, not quite 60 pounds sterling. His wife was also in bad health, and provisions were very dear, and he found that he could not remain in Paris. The Marquis de Girardin, being informed of this, kindly offered Rousseau a permanent habitation at his château of Ermenonville near Chantilly. Rousseau accepted for his residence a detached cottage near the family mansion, whither he removed in May, 1778. In this new abode he appeared for once contented. He used to botanise in the neighbourhood with one of the sons of the marquis. On the first of July he went out as usual for the purpose, but returned home fatigued and ill. The next morning after breakfast he went to his room to dress, as he intended to pay a visit to Madame de Girardin, but he felt exhausted, and his wife coming in gave the alarm. Madame de Girardin came at once to see him; but Rousseau, whilst thanking her for all her kindness, begged of her to return to her house, and leave him for the present. Having requested his wife to sit by him, he begged her forgiveness for any pain that he might have caused her, and said that he died in peace with all the world, and that he trusted in the mercy of God. He asked her to open the window, 'that he might once more behold the lovely verdure of the fields.' 'How pure and beautiful is the sky,' observed he: 'there is not a cloud on it. I hope the Almighty will receive me there.' So saying, he fell with his face to the ground, and when he was raised, life was extinct. His death was purely natural, and not in consequence of suicide, as was said by some. He was buried, according to his request, in an island shaded by poplars, in the little lake of the park of Ermenonville, and a plain marble monument was raised to his memory.

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Through his deficient education, and his infirmities of judgment and temper, Rousseau was totally unfit to be a political writer. He set a pernicious example to many others, who were still less qualified by proper study to consider themselves as legislators and reformers. Rousseau by his eloquence misled the understanding: Voltaire by his sneers and ribaldry destroyed all moral feeling. Both writers exerted a great influence on the generation which they saw grow up, and which afterwards effected the great French revolution; and yet Rousseau might well disclaim all intention to contribute to such a catastrophe. While Helvetius maintained the principle that 'any action becomes lawful and virtuous in the furtherance of the public weal,' Rousseau says that 'the public weal is nothing unless all the individuals of society are safe and protected.' And elsewhere he says that if the attainment of liberty should cost the life of a single man, it would be too dearly bought. He also said, speaking of his 'Contrat Social,' that it was not written for men, but for angels. M. Angar one day introduced his son to Rousseau, saying that and others, which are of a lighter character, are exceedingly graceful.

(*Biographie Universelle; Dictionnaire de la Conversation;* Auger, *Essai Biographique et Critique.*)

ROUSSEA'U, JEAN JACQUES, born at Geneva in 1712, was the son of a watchmaker. While yet a child he lost his mother, and his father having married again, young Rousseau was removed from his paternal roof, and after remaining for some time at a village school in the neighbourhood of Geneva, was apprenticed to an engraver, a coarse man, whose brutal treatment tended to sour a temper naturally irritable and morose. The boy became addicted to idle habits, and to lying and pilfering. At last, through fear of punishment for some act of misconduct, he ran away from his master, and wandered into Savoy, where, finding himself destitute, he applied to the bishop of Annecy, on the plea of wishing to become a convert to Catholicism. The bishop recommended him to Madame de Warens, a Swiss lady, who, being herself a convert to Catholicism, had settled at Annecy. Through her kind assistance he obtained the means of proceeding to Turin, where he entered the college of the Catechumeni, and after going through a preparatory course of religious instruction, he abjured the Reformed religion and became a Roman Catholic. But as he refused to take orders, he was dismissed from the establishment, and left to his own resources. Accordingly he became a domestic servant, but his want of discretion and self-control rendering him unfit for his situation, he left Turin and recrossed the Alps. He found Madame de Warens residing at a country-house near Chambery, who received him kindly, and afforded him support and protection in her own house during the next ten years. Of his foolish, profligate, and ungrateful conduct during a great part of this period he has given an account in his 'Confessions.' After many absences and many returns, he quitted her finally in 1740, with letters of introduction for some persons at Lyon. He acted in succession as preceptor, musician, and private secretary to the French envoy to Venice, whom he followed to that city. From Venice he came to Paris, in 1745. On alighting at an inn, he became acquainted with a servant girl, Therese Levasseur, with whom he formed a connection which lasted for the rest of his life. He attempted to compose music for the stage, but he did not succeed in selling it. His next employment was as a clerk in the office of M. Dupin, fermier-général, where however he did not remain long. In 1748 he became acquainted with Madame d'Epinay, who proved one of his steadiest and truest friends. At her house he formed the acquaintance of D'Alembert, Diderot, and Condillac, and by them he was engaged to write articles for the 'Encyclopédie.'

One day he read in an advertisement that a prize was offered by the Academy of Dijon for the best essay on the question—'Whether the progress of science and of the arts has been favourable to the morals of mankind?' Rousseau determined to support the negative, and Diderot encouraged, but did not originate, his determination. He supported his position in a style of impassioned eloquence, and obtained the prize. His success confirmed him in his bias for paradox and exaggeration, and henceforth he seemed to have adopted as a general principle that the extreme opposite to wrong must of necessity be right. His opera, 'Le Devin du Village,' was played before Louis XV., at the Court Theatre of Fontainebleau. Rousseau was in one of the boxes with a gentleman of the court. The king, being pleased with the opera, expressed a desire to see the author, which being signified to Rousseau, his shyness took alarm, and he actually ran away out of the house, and did not stop till he reached Paris. He had neither easy manners nor facility of address, and his own acute feeling of these deficiencies tormented him throughout life, and tended to perpetuate and increase his natural awkwardness. In order to hide these imperfections, he affected disregard of manners, and put on the appearance of a misanthropist, which he in reality was not. He lived chiefly by copying music, and several persons who knew his straitened circumstances sent him work, for which they offered him three or four times the usual remuneration, but he never would accept anything beyond the accustomed price.

In 1753 he wrote his 'Lettre sur la Musique Française,' which sorely wounded the national vanity. His next publication, a letter to D'Alembert, 'Sur les Spectacles,' gave rise to a controversy between them. He wrote also a 'Discours sur l'Origine de l'Inegalité parmi les Hommes,' which was admired for its eloquence; but his usual p
vein runs through the whole composition. Rouss
that man is not intended for a social state; tha
bias for a solitary existence, and that the condit
savage in his native wilds is a true state of freed
natural state of man, and that every system of
infraction of man's rights. He also maintains th
are born equal, in spite of the daily evidence whic
of the inequalities, physical and moral, observab
childhood. This idea of the equal rights of me
not from reason or religion, but from his favourit
man's equality in a state of nature, Rousseau
developed more fully in his 'Contrat Social,' a w
after leading astray a number of people, and c
siderable mischief, is now regarded by all sound
a superficial essay. [ROMAGNOSI.] It is a curio
Rousseau, after reading the works of Bernar
Pierre, had observed that in all the projects of
government of that writer there was the fundam
of 'supposing that men in general and in all case
duct themselves according to the dictates of
justice, rather than according to the impulse of
passions or wayward judgment.'

In 1756 Rousseau, at the invitation of Madame
took up his residence at her country-house cal
mitage, in the pretty valley of Montmorency
Here he began to write his celebrated novel, 'J
Nouvelle Heloïse,' which he finished in 1759. I
value as a work of imagination or invention, but
cimen of impassioned eloquence it will always h
Rousseau, while he wrote it, was under the infl
violent attachment for Madame d'Houdetot, siste
Madame d'Epinay; and this passion, absurd an
though it was, served to inspire him during the
his work.

'La Nouvelle Heloïse' has been censured as
render vice an object of interest and sympathy.
racter of the hero is culpable, for he forgets the
of hospitality, and betrays the confidence repos
But here we again perceive the influence of
favourite paradox; for, in a state of nature, such
seau fancied it, the relative position of St. Preu
and her parents would not have been the sa
novel, for they would have all been savages to
the intimacy of St. Preux with Julie would b
matter of course. Rousseau however, by the
which he has drawn of Julie after she becomes
paid a just homage to the sacredness of the mar
and to the importance of conjugal duties, which
the foundation of all society. Rousseau adm
and felt its value, though he did not always foll
He says of himself, that after much reflection,
nothing but error among philosophers, and opp
misery in the social state, he fancied, in the del
pride, that he was born to dissipate all prejudices
he saw that, in order to have his advice listened
duct ought to correspond to his principles. It w
in compliance with this growing sense of mora
at last he married the woman whom he had s
living with, who had then attained the age of
and who, as he himself says, did not possess eit
or personal attractions, and had nothing to rec
except her attention to him, especially in his fi
or despondency. He also repented in the latt
his life of having sent his illegitimate children to
ling hospital.

Rousseau's 'Emile,' which appeared in
tained a new system of education. He gives
precepts, especially in the first part of the b
was productive of a beneficial change in the
ment of children in France: it induced mot
higher orders to nurse their children themselves
the discontinuance of the absurd practice
dling infants like mummies; it taught parents t
the feelings of children, and to develop their rat
ties rather than frighten them into submission
or threats, or terrify them by absurd stories.
respects Rousseau was a benefactor to children,
proceeded in his plan for older boys, he became
speculations about religion and morality, which g
both to Roman Catholics and Protestants. The
of Paris condemned the book. The archbisho
'mandement' against it. The States-General o

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s ways, which however the suspicious temper of Rous-
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Pierre in the Lake of Bienne, where he assumed,
knows why, the Armenian costume. Being sent
rom thence by an order from the senate of Bern, he
ed the kind invitation of David Hume, who offered
quiet asylum in England. Rousseau arrived in Lon-
January, 1766, and the following March went to
n in Derbyshire, where Hume had procured him a
residence in the house of Mr. Davenport. It was
ng however before Rousseau quarrelled both with
and Davenport, and suddenly returned to France. A
ad appeared in the newspapers bearing the name of
ic of Prussia, and reflecting severely upon Rous-
moral infirmities. Rousseau accused Hume of be-
author or planner of the pretended communication.
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st designs against him. The correspondence that
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upon his wayward temper. He now fell into a real or
d state of misanthropy, fancying that everybody was
ring against him, and he complained at the same time
e mental suffering. Byron, who in his mental bias
me points of resemblance with Rousseau, thus de-
him:

> 'His life was one long war with self-sought foes,
> Or friends by himself banished; for his mind
> Had grown suspicion's sanctuary, and chose
> For its own cruel sacrifice, the kind,
> 'Gainst whom he raged with fury strange and blind.
> But he was phrenzied—wherefore, who may know?
> Since cause might be which skill could never find;
> But he was phrenzied by disease or woe,
> To that worst pitch of all, which wears a reasoning show.
>
> For then he was inspired, and from him came,
> As from the Pythian mystic cave of yore,
> Those oracles which set the world in flame,
> Nor ceased to burn till kingdoms were no more.'
>
> (*Childe Harold*, canto iii.)

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rench ministers had imposed restrictions upon his
g. One of his friends applied to the duke of Choi-
n the subject. The duke's answer, dated 1772, is as
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Rousseau set to music about one hundred French 'Romances,' some of them very pretty, which he published under the title of 'Consolations des misères de ma vie.' He was passionately fond of music, though he seems not to have attained a profound knowledge of the subject.

There have been several editions of Rousseau's works: those of Lefevre, 22 vols. 8vo., 1819-20, and of Lequien, 21 vols 8vo., 1821-2, are considered the best.

The town of Geneva has raised a bronze statue to his memory in the little island where the Rhône issues from the lake, which is a favourite promenade of the citizens.

ROUSSILLON, a province of France, coinciding with the department of Pyrénées Orientales, under which it is described. It obtained its name from the town called by the Romans Ruscino, and afterwards Rosciliona, now Tour de Roussillon, near Perpignan. It was subdivided into Roussillon, properly so called, chief town Perpignan: Le Valespir, chief town Prats de Mollo; Le Conflent, chief town Villefranche; Le Capsir, chief town Puyvalador; La Cerdagne Française, chief town Mont Louis; and La Vallée de Carol, chief place Carol. [PYRENEES ORIENTALES]

Its condition under the Romans is mentioned elsewhere. [PYRENEES ORIENTALES.] The country came afterwards into the hands of the Visigoths, the Saracens, and the Franks. In the ninth and tenth centuries it was united with the county of Ampurias in Spain; but towards the close of the tenth century they were separated. In 1173 this county was bequeathed, by its count Gérard or Guinard II., to Alphonso, king of Aragon. It was ceded by John II. of Aragon to Louis XI. of France, in pledge for the repayment of money borrowed; but restored by Charles VIII. to Ferdinand the Catholic. In the reign of Philip IV. of Spain, the inhabitants of this province joined the Catalans in their resistance to the Count-Duke Olivarez. The French, who had early fomented the rebellion, afterwards openly took part in it, and ultimately obtained possession of Roussillon, which by the treaty of the Pyrenees, A.D. 1659, was ceded to them.

ROUT. [RIOT.]

ROVERE'DO. [TYROL.]

ROVIGNO. [ILLYRIA; ISTRIA.]

ROVI'GO, *the Province of*, in the Lombardo-Venetian kingdom, is bounded on the north by the province of Padua, from which it is divided by the Adige; east by that of Venice, west by the provinces of Verona and Mantova, and south by the papal province of Ferrara, from which it is separated by the Po. The length of the province of Rovigo is 35 miles from east to west, and its greatest breadth is about 15 miles. The surface is flat, and is crossed by various canals, which communicate with the Po and the Adige.

The principal towns of the province are:—1, Rovigo, the capital of the province, a bustling modern town, with about 7000 inhabitants, a collegiate church, the Palazzo del Podestà, or government-house, and church dedicated to the Virgin, with some good paintings. Luigi Celio Richeno, who took the surname of Rhodiginus, a learned man of the sixteenth century, and author of the 'Antiquæ Lectiones,' was a native of Rovigo. 2, ADRIA. 3, Badia, a small town, with a manufactory of fine pottery.

The province of Rovigo produces abundance of corn, hay, hemp, pulse, and fruits. Its population amounted to 135,000, by the census of 1833. (Serristori, *Statistica*.)

ROWAN-TREE, or **ROAN-TREE**, is a species of *Pyrus*, known also under the names of the Fowler's service-tree and mountain ash. Its Latin name, *P. aucuparia*, and its various modern designations, have been given to it on account of the general use made of its fruit for the purpose of decoying birds into traps. It is much cultivated, both on account of its valuable wood and rapid growth. It is known from the other species of Pyrus by its slightly glabrous serrated leaflets and its globose fruit. It is found in most parts of Europe, in the north-west of Asia, in Nova Scotia, and other regions of the northern parts of North America, and in the island of Japan. It does not however attain equal magnitude in all climates. In its most northern localities and alpine situations it is a low shrubby bush: whilst in southern districts it forms a handsome tree, growing to the height of twenty or thirty feet. The finest trees in this island are found in the Western Highlands and on the west coast of Scotland. This tree has enjoyed from remote times a distinguished reputation. A belief in its power against witchcraft and evil spirits of all kinds seems to have been prevalent at a very early date; and, according to Lightfoot, in his 'Flora Scotica,' it was till a late period held in high reputation in Scotland as a charm against evil influence. It is through a hoop of this wood that sheep are made to pass night and morning as a preservative against evil spirits.

The rowan-tree is a graceful tree, with an erect stem and orbicular head. It grows very rapidly for the first three or four years of its existence, and, on this account, it is well adapted for planting with young oaks, which it protects till they grow above it, when it is destroyed by their shade. It also forms excellent coppice-wood, the shoots being adapted for poles and for making hoops. The bark is used by tanners. The leaves, when dried, have been sometimes used in the north of Europe as a substitute for wheat in times of scarcity. It is prized next to yew for making the bow. In Wales it is as religiously planted in churchyards as the yew is in England.

The rowan-tree will grow in almost any situation, being found on the sea-shore and the tops of mountains. Hence it is a valuable plant for growing in places exposed to the sea or in very open situations. It flourishes best in a free soil, near water, and in open airy spots, especially in a moist climate.

ROWE, NICHOLAS, an English dramatic poet, was born at Little Beckford in Bedfordshire, in 1673. His father was John Rowe, of an old Devonshire family, and a serjeant-at-law of some eminence in his day. The son was educated at Westminster under Busby, and chosen one of the king's scholars. At the age of sixteen he was removed from school by his father, and entered as a student of the Temple. He studied law for about three years, when, being left his own master by his father's death, he began to turn his attention to poetry, and withdrew himself from the less attractive reading of his profession. When he was twe five years of age he produced a tragedy, called 'The tious Step-Mother,' which was very well received: 1702 appeared 'Tamerlane,' in which play, according to the taste of the time, Louis XIV. and William III. are represented respectively by Bajazet and Tamerlane.

This tragedy obtained great popularity, from its connection with the politics of the day. In 1703 was published 'The Fair Penitent;' and in the interval between this and his death he wrote 'Ulysses,' 'The Royal Con comedy called 'The Biter,' which proved a failure, Shore,' written professedly in the style of Shakspere, tho with little of Shakspere's manner, and lastly 'Lady Grey.' In the mean time he had other avocations besides poetry: we find him in the office of under secretary for three years when the duke of Newcastle was secretary of state, and after having been made poet-laureate at accession of George I., he was appointed one of the land-surveyors of the customs of the port of London. He also clerk of the council to the prince of Wales, and was made secretary of the presentations by Lord Chancellor Parker, afterwards Lord Macclesfield. Rowe died De ber 6, 1718, aged forty-five, and was buried in West Abbey. He was twice married, and had issue by wives. Besides the plays enumerated, he wrote short p a translation of Lucan, and of Quillet's 'Callipædia.' published an edition of Shakspere, in which there are, according to Johnson (*Life of Rowe*), some happy restora of his author's text. In the composition of his d Rowe shows little depth or refined art in the portraying of character, but he writes with the easy grace of a well-educated man of fashion, undisturbed by the cares of authorship, or the ambition of writing himself into no at the expense of good taste. His versification is harmonious, and the language of his characters natural in the dialogues. 'The Fair Penitent' contains several passages which are well wrought and show great powers of imagina His translation of Lucan has been much praised by Johnson for preserving the spirit of the original, though upon comparison it will often be found feebly diffuse. His other poems are not of sufficient importance to require a separate notice.

(Johnson's *Lives of the Poets*, who quotes a few Life written by Dr. Welwood, and prefixed to the early editions of his works.)

LEY, WILLIAM, an English dramatic writer, of
e hardly anything is known. He flourished during
of James I., and belonged to the royal company of
and as an actor excelled most in comedy. The
Rowley, once a rare scholar of Pembroke Hall, in
,' mentioned by Meres (2nd part of 'Wit's Com-
,' 1598) is probably some earlier author. Rowley
ny plays, of which the following are the best known:
Wonder, a Woman never vext,' a comedy, 4to.,
tragedy, called 'All's lost for Lust,' 4to., 1633.
h at Midnight,' a comedy, 4to., 1633. 'A Shoo-
Gentleman,' a comedy, 4to., 1638. 'The Witch of
n,' a tragi-comedy (in this he was assisted by Tho-
ar, John Ford, &c.), 4to., 1658. 'The Birth of
4to., 1662. Shakspere is said to have aided him in
The titles of others of his plays may be found in
Bibliotheca Britannica,' and the 'Catalogue of the
f the British Museum.' Rowley is a somewhat un-
writer, hardly deserving a less obscure fate than he
vith. Hazlitt, 'Lectures on the Dramatic Lite-
the age of Elizabeth,' says of him, 'Rowley appears
xcelled in describing a certain amiable quietness of
n and disinterested tone of morality, carried almost
doxical excess, as in the comedy of the "Woman
ed," which is written, in many parts, with a pleasing
and naiveté equal to the novelty of the conception.'

l of his plays are printed in Dodsley's collection.
author of a rare tract, noticed with extracts in the
ibliographer,' iv., entitled, 'A search for Money; or,
ntable complaint for the losse of the wandering
nsieur l'Argent; or, Come along with me,
ou lovest money: dedicated to all those that lack
y William Rowley,' London, 1609, 4to.; a com-
ll of the ribaldry and low wit of his time.
tices of his life, see a copy of Langbaine's 'Dra-
ets,' with MS. notes, in the British Museum, and
ements in Collier's 'Dramatic History.' Two ex-
m his plays are given in Lamb's 'Specimens of
Dramatic Poets.'

NA was the daughter of Oxyartes, a Bactrian
o fell into the power of Alexander (B.C. 327), on
est of a strong natural fortress in Sogdiana, where
had placed his wife and daughters. Roxana was
d by the followers of Alexander to be the hand-
oman they had seen in Asia after the wife of
d her beauty made such an impression on Alex-
t he resolved to share his throne with her. Rox-
was with child at the death of Alexander, subse-
ore a son, to whom the name of Alexander was
l who was acknowledged as partner of Arrhidæus
the empire. Statira, the other wife of Alexander,
upposed to be pregnant; and accordingly, Roxana
st Statira's child should become a rival of her own
d her and her sister Drypetis to Babylon, where
put to death with the concurrence of Perdiccas.
nd her son subsequently fell into the hands of
r, who kept them in close confinement in Mace-
the treaty of B C. 311, made between the principal
f Alexander, it was agreed that Cassander should
military governor (στρατηγός) of Europe, till the
xana came of age. Cassander however, to remove
cle to the throne, put to death the young king and
r in the following year.
Sic., xxi. 105; Droysen, *Geschichte der Nachfolger*
rs.)

URGH. [ROXBURGHSHIRE.]

JRGH, WILLIAM, M.D., a native of Scotland,
eeded to India in the medical service of the East
npany, and distinguished himself by his attention
otany of that country. In the early part of his
attention was confined to the peninsula, as he was
at Samulcottah from the year 1781, where he paid
attention to the cultivation of pepper. Into
tions established for this purpose he introduced the
namon, nutmeg, annotto, bread-fruit tree, sappan-
, and mulberry. He also endeavoured to introduce
of silk, as well as to improve the manufacture of
was remarkable throughout for the great atten-
h he always paid to the improvement of the re-
f the country. He knew and corresponded with
pupil of Linnæus, who first gave an impulse to
botany in India. Dr. Roxburgh made large collections of plants in the Carnatic, but he had the misfortune to lose them all, with his books and papers, in an inundation at Injeram. He however recommenced making a fresh collection, and the Court of Directors sent him out a present of botanical books.

In the autumn of 1793, from his great merits, he was removed to Calcutta, where he was appointed superintendent of the botanic garden which had been established by Colonel Kyd. During his superintendence, which extended to 1814, few men have laboured with greater zeal, assiduity, and success, though he had very indifferent health; having been obliged to make three separate voyages for its re-establishment, once to the Cape and twice to Europe, on the latter of which occasions he died, in 1815. On one of these occasions Dr. Carey, the celebrated missionary and Orientalist, took charge of the garden, and published, at Serampore, Dr. Roxburgh's catalogue of the contents of the botanic garden at Calcutta. From Dr. Carey's preface to this catalogue we learn that the number of described species then in the garden amounted to 3500, of which 1510 were named and described by Dr. Roxburgh, besides 453 which, though described, had not then been introduced. Besides describing, he had been in the habit of having splendid drawings made of the various plants that he discovered; these, to the amount of 2000, were sent to the Court of Directors. At their request, Sir Joseph Banks undertook the general superintendence of the publication of a work in which a preference was given to subjects connected with medicine, the arts, and manufactures, and which is now well known as Roxburgh's 'Coromandel Plants,' in 3 vols. fol., with 300 coloured engravings. Dr. Roxburgh's general descriptive work of the plants of India, called 'Flora Indica,' was not published for many years after his death. An edition was commenced, to be published at Serampore, by Dr. Carey, with additions by Dr. Wallich, the first volume in 1820, and the second in 1824. A complete edition, in 3 vols., was published by Dr. Roxburgh's sons, in 1832.

ROXBU'RGHIA, a genus of plants named in honour of Dr. Roxburgh. The genus was first published in his own 'Coromandel Plants,' and hence a French author has chosen to say that Roxburgh is the only botanist who has named a plant after himself, but the preface to the work would have informed him that Dr. Roxburgh's MSS. and drawings, having been sent by him from India to the Court of Directors of the East India Company, were published by them under the superintendence of Sir Joseph Banks, and by him and Mr. Dryander this genus was named Roxburghia. Being considered peculiar in many points, it was thought by Dr. Wallich to be typical of a new order, and called Roxburghiaceæ, but it is accounted allied to and a tribe of Smilaceæ. The genus is characterised by having an eight-leaved corol-like perianth, of which the outer leaflets are broad and spreading, the inner ones elliptical, acuminate, and erect. Anthers four, ovary sessile, capsule one-celled, two valved, many seeded. There are only two species of the genus, R. gloriosoides, a native of the moist valleys of the Indian peninsula; and R. viridiflora, discovered in the Chittagong district by Dr. Hamilton, and said to have long trailing stems, sometimes one hundred fathoms in length. The same species seems to be found also in Siam, Cochin-China, and the Moluccas.

ROXBURGHSHIRE, a Scotch county situated on the south-eastern border, is bounded on the north by Berwickshire; on the east and south-east by the English county of Northumberland; on the south by the English county of Cumberland; on the south-west by Dumfriesshire; on the west by Selkirkshire; and on the north-west by Edinburghshire. Its form is very irregular: the greatest length is from north-north-east to south-south-west, from the banks of the Tweed between Kelso and Coldstream, to the banks of the Liddel Water at the junction of Dumfriesshire and Roxburghshire, 43 miles; the greatest breadth at right angles to the length is from the junction of Edinburghshire, Berwickshire, and Roxburghshire, to the Cheviot Hills on the Northumberland border, 30 miles. Its area is variously estimated; by Chalmers (*Caledonia*, vol. ii., table facing p. 26), at 696 square miles; by Playfair (*Description of Scotland*), at about 700 square miles; and by M'Culloch (*Statistical Account of the British Empire*), at 715 square miles, or, including the area of its lochs, 715¼ miles. Roxburghshire lies between 55° 5′ and 55° 42′ N. lat., and between 2° 11′ and 3° 8′ W. long.

The population, in 1801, was 33,682; in 1811, 37,230;

in 1821, 40,892; and in 1831, 43,663, showing an increase in the last ten years of about 7 per cent.: there were, in 1831, 61 inhabitants to a square mile. In respect of size it is the thirteenth of the Scotch counties; in respect of amount of population, the sixteenth; and in respect of density of population, the twentieth (Ross and Cromarty being taken as one county). Jedburgh, the shire town, is on the Jed Water, a small brook flowing into the Teviot, about 333 miles from the General Post-office, London, by Stamford, Doncaster, Boroughbridge, Durham, and Newcastle, and 45 miles from Edinburgh by Dalkeith and Lauder.

Surface, Geology, Hydrography, and Communications.—The whole surface of the county is undulating; but in the northern and central parts the hills are of less elevation than along the English and Dumfriesshire borders. A range of lofty hills extends from the eastern extremity of the shire south-west along the border of Northumberland, to which the general designation of Cheviot Hills, properly applicable only to a part of the range, is sometimes given. Arkhope Cairn, Cock Law, Windygate Hill, Blackhall Hill, Musey Law, Fairwood Fell, Carter Fell (2020 feet), and Trouting Crag form part of this range, which separates the basin of the Tweed from the basins of the Coquet and the Tyne. From the head of the Jed Water the range of hills turns westward and runs through the county into Dumfriesshire, separating the basin of the Tweed from that of the Eden. From each side of the range, hills irregularly grouped overspread a wild pastoral district drained by the upper waters of the Teviot on the one side and the Liddel on the other. In the separating range are Need's Law, Fanna Hill, Windborough or Windburgh Hill (2000 feet), the Maiden Paps, Greatmoor Hill, Caldeleugh Hill, Tudhope Hill (1830 feet), Wisp Hill (1830 feet), and Pikethaw Hill. In the hills of Lidisdale, or Liddesdale (the country drained by the Liddel), are Peel Fell, the Lauriston Hills, White Know, Tinnis Hill, Loch Know, and the Mellingwood or Mildenwood Hills (about 2000 feet). In the northern part of the county, rising on the south bank of the Tweed near Melrose, are the Eildon Hills (1364 feet); and on the banks of the Teviot near the centre of the county are Ruber's Law (1419 feet) and Dunian (1120 feet) on the south side, and the Minto Crags (721 feet) and Minto Kame on the other. The altitudes are from Chalmers's *Caledonia*; Playfair's *Description of Scotland*; and the *New Statistical Account of Scotland*.

The eastern side of the county is chiefly occupied by the formations of the red-marl or new red-sandstone group; the western side by the grauwacke rocks; the Cheviot or border hills are chiefly of trap formations; and Liddesdale is occupied by the coal-measures. The red-marl formations extend westward along the valleys of the Tweed and the Teviot as far as a line drawn from the neighbourhood of Lauder in Berwickshire southward to Hobkirk on the Rule, and then east and north-east by Southdean, Old Jedburgh, Oxnam, and Yetholm to the border of the county: detached portions are found beyond this limit. The predominant if not the only rock of this formation is a sandstone, commonly red but sometimes white. It frequently occurs in strata of considerable thickness, and is employed as a good building-stone; for which purpose both the red and white varieties are quarried. It more commonly however occurs in thin horizontal beds, soft, brittle, and easily decomposing. Some of the beds have been supposed to be of the old red-sandstone formation. A small portion of the Northumberland coal-field extends into the county near the head of the Jed and the Kail waters, and overspreads the whole of Liddesdale. Scarcely any coal is dug in the county, except perhaps a little in Liddesdale. The western side of the county, from the boundary of the red-sandstone, is occupied by the grauwacke, which constitutes the mass of the hills separating Teviotdale and Liddesdale, on the southern slope of which hills the coal-measures rest. From Hobkirk the grauwacke occupies a narrow tract of country extending north-eastward, being covered by the red sandstone on the north and west, and interrupted by the trap rocks on the south and east. The strata of the grauwacke are generally vertical, occasionally however varying from a vertical position by an angle of 30°. The whole of the district which this rock occupies is hilly; but some of the higher peaks are of trap or porphyry.

The trap and porphyritic formations of the border hills comprehend greenstone, basalt, trap tuff, amygdaloid, and especially a felspar porphyry of reddish-brown colour. In the red-sandstone district trap rocks, in dikes or other modes of occurrence, are frequent.

Limestone is procured in some parts of the county; Liddesdale it is abundant.

The county belongs almost entirely to the basin of the Tweed. Liddesdale alone belongs to that of the Eden. The Tweed itself first touches the border of the county at the junction of the Ettrick Water; it flows eastward, sometimes within and sometimes upon the border, passing Abbotsford, Melrose, St. Boswell's, Makerston, Kelso, and Sprouston, between which village and the town of Coldstream (Berwickshire) it quits the county: that part of its course which belongs to Roxburghshire may be est at 27 or 28 miles.

The principal affluent of the Tweed is the Teviot, which flows through the county in nearly its whole extent, giving to the greater portion of it the name of Teviotdale. The Teviot rises in the hills on the south-western border toward Dumfriesshire, and flows with a very direct course to the north-east, past Hawick and Denholm, to Eckford, where it turns northward and joins the Tweed at Kelso; its whole course may be estimated at from 36 to 38 miles. It drains nearly the whole county, receiving the Allan, the Slitrig, the Rule, the Jed, and the Kail from the Northumbrian border, or from the range which separates Liddesdale from the rest of the county, and the Borthwick and the Ale from the border of Selkirkshire. The Ettrick, the Gala, the Leader, the Eden, and other small affluents of Tweed have part of their course in this county. Liddesdale is drained by the Liddel and the Hermitage, a tributary of the Liddel, with some smaller streams, all of which belong to the basin of the Cumbrian Eden. The Liddel receives all the other streams of Liddesdale, and joins the Esk, which falls into the same æstuary as the Eden.

'The immediate banks of the Tweed are generally precipitous, on one side at least, sometimes on both, so that the river, flowing in a deep bed, is frequently invisible from the public roads, and many of its striking beauties are known therefore only to those who are familiar with the district. Everywhere however from the higher grounds views of the river, and of a richly wooded and highly cultivated country, are exceedingly fine.' (*New Statistical Account of Scotland.*) The whole course of the Teviot is beautiful; it flows in the bottom of a spacious open valley, the sides of which often rise to a considerable height; the banks are adorned with beautiful seats, and the stream is generally visible from the public roads. Above Hawick the valley is narrower, and becomes pastoral rather than agricultural.

None of the streams are navigable, except for ferry-boats or other very light boats.

The roads are generally very good. Those in the [illegible] districts of the country, which have been more recently made, are perhaps the best, from the greater skill and knowledge displayed in choosing their line and directing their construction. Several roads from London to Edinburgh pass through this county. One, through Newcastle, Morpeth, and Wooler, just crosses the north-eastern part through Kelso; another, branching from this at Morpeth, passes through Jedburgh and St. Boswell's; and a third, through Penrith and Carlisle, crosses the western side of the county through Dryden and Hawick to Selkirk in the adjoining county of Selkirk. A road from Hawick follows the vale of the Teviot, and then of the Tweed, through Kelso to Berwick in Berwickshire. There is coach communication along the Edinburgh roads, and also along the road from Hawick to Berwick.

Soil and Agriculture.—The soil in the western parts of the county, where the predominant rock is grauwacke, is generally a thin cold wet clay; capable, in some cases where it has been intermingled with the ingredients of other rocks, and improved by underdraining, of producing good though late white crops. A poor sandy soil, intermixed in the higher grounds with peaty matter, usually characterises the districts occupied by the coal-measures. The red sandstone district, where the sandstone is finer grained, and more clayey and adhesive, is marked by a deep rich red soil producing its harvest rather early; but where the sandstone is more siliceous and loose, the surface is covered with a barren sand. The trap and porphyry district is usually covered by a loose, light, warm, and dry soil, except in the bottoms, where there is usually a deposit of rich strong clay loam. The highest parts of the trap district afford the finest sheep pasture in the county.

About one-third of the county is under tillage; of the remainder a small part is moor-land, and another small portion wood-land; but by far the greater part is occupied as sheep walks. It is supposed that the quantity of arable land has increased one-third within the last forty years. At the commencement of the present century, the arable land, except in the immediate vicinity of the rivers, was scattered in irregular patches, and was altogether unenclosed. But the great improvements which have taken place since that period by the introduction of the drill turnip husbandry; the use of lime, bone dust, and other foreign manures; a better system of draining, and the intermixture of the feeding and grazing of live stock with tillage, have immensely increased he productiveness of the soil, as well as induced the extenn of cultivation. On the larger farms, the enclosures nerally contain from twenty to forty acres; the fences on he older farms are usually quick hedges with trees interspersed, but in the newer farms they are commonly dry tone dykes or walls. A very common rotation is as follows: —1st year, turnips or potatoes; 2nd, barley, oats, or wheat; 3rd, grass; 4th, oats. Sometimes this 'four-year shift' is xchanged for one of five years, by giving two successive ears to grass; and at other times peas or beans, drilled, are ubstituted for potatoes or turnips. The number of sheep s supposed to have increased one-third since the beginning f the century; and considerable attention has been shown f late years to the breeding both of cattle and sheep. The avourite breeds of sheep are the Cheviot for the hill pasures, and the Leicester or long-woolled for the lower grounds. A cross between these two is found to answer very well. The most common sort of stock is the Teesdale or hort-horned, but the Ayrshire and the Highland kyloe are also kept; and the small farmers and married farm-servants have sometimes a mixed breed of milch cows, produced by crossing the Teesdale with the Ayrshire, or the Galloway with the Highland.

On the tops of the border hills heath is still found, but he quantity of it has been diminished by the extension of sheep-feeding. Some parts, where the soil is wet, are covered with coarse bent grass, which is used occasionally as fodder for cattle or sheep.

During the first American war, an attempt was made to ntroduce the cultivation of tobacco. The first trial was made in Melrose parish, and was successful even beyond expectation. The profit was very great, and the cultivation was beginning to extend, when it was put down by Act of Parliament. The plants grew best in a dry light soil well manured. (*Beauties of Scotland.*)

Swine are reared by cottagers, farm servants, tradesmen, and others, in considerable number; but they are not kept to any extent by the farmers. The pork is cured at Berwick, and sent up to the London market. Poultry are kept by the same classes of persons as pigs. There are some very productive orchards in the neighbourhood of Jedburgh, Kelso, and Melrose.

The rents of farms have increased during the present century from 30 to 50 per cent., and in some cases even more. Tillage-farms average from 400 to 600 acres; sheep-farms from 1000 to 3000; and farms partly arable and partly pastoral, from 600 to 1400. Leases are usually for fourteen or twenty-one years. The chief landowners are the dukes of Roxburgh and Buccleugh, the marquises of Lothian and Tweeddale, the earl of Minto, and the families of Ker, Scot, Elliot, Douglas, Pringle, Rutherford, Don, &c. Many of the farmers are enterprising and intelligent; and proved methods of cultivation are extending among them, hough by no means so rapidly as is desirable. Farm servants very commonly reside in little cottages grouped together so as to form a hamlet in the neighbourhood of the farm-house and offices. Of these cottages, such as have been built of late years have been made much better than similar buildings were previously made; but the older ones are wretched hovels, worse than the sheds or houses appropriated to the cattle.

Divisions, Towns, &c.—The county is divided into four districts, as follows:—Castletown-Melrose district, in the north-west part of the county (except Castletown parish, which is in the south), containing six parishes and part of another (Galashiels, with Lindean, chiefly in Selkirkshire); Hawick district, in the west, containing four parishes and parts of three others (Ashkirk, Robertown, and Selkirk, all partly in Selkirkshire); Jedburgh district, central, containing eight parishes; and Kelso district, including eleven parishes and part of a twelfth (Stitchel, partly in Berwickshire), which constitute the eastern portion of the county, making in all twenty-nine parishes wholly, and five partly in Roxburghshire. Of the five parishes which are only partly in this county, Stitchel, Robertown, and Ashkirk may be considered as belonging to Roxburghshire, the greater part of their population being within it.

There are five market-towns, namely, Jedburgh (the shire town, also a royal burgh), Kelso, Hawick, Melrose, and Castletown.

Jedburgh (colloquially Jeddart or Jethart) is on the Jed Water, which flows into the Teviot. The parish consists of two detached parts, the one in which the town is situated being near the centre of the county, the other on the Northumberland border: the whole area is about 38 square miles; and the population, in 1831, was 5647, of whom 3617 were in the town. The name of the parish was antiently written Gedworde, Jedworth, Jedwood, and Jedburgh: the first syllable, Ged or Jed, the name of the stream on which the town stands, has been supposed to embody the element of the name Gadeni (Γαδηνοι in the Greek geographers), by which the nation who inhabited this part of the kingdom were distinguished. The parish was celebrated in antient times for its woodland fastnesses, its castles and fortified dwellings, and the magnificence of its ecclesiastical establishments.

At Old Jedworth, four miles from the town, are the slight ruins of a chapel, with its grave-yard; and on the south side of the present town are the more prominent remains of Jedburgh Abbey. This abbey (of canons regular, imported from Beauvais in France) appears to have been founded in the first half of the twelfth century, but the year is doubtful. Some persons suppose its foundation to have been much earlier. It suffered much during the wars with the English, was pillaged and burned by the earl of Surrey at the storming of Jedburgh in 1523, and again injured by the earl of Hertford (afterwards duke of Somerset) in A.D. 1545. The church alone remains: it is 230 feet long. The choir is much dilapidated, and the south transept has disappeared; but the nave, north transept, and central tower, 100 feet high, are in better preservation. The western part of the nave has been fitted up, and is used as the parish kirk. The western end is a lofty gable, with a beautiful Norman door; and there is another beautiful Norman door, which once was the entrance from the cloisters. The architecture appears to be Norman, intermingled with Early English. On the south side of the choir is a chapel, formerly used for the grammar-school. Foundations of the monastic buildings are found extending to a considerable distance from the church, and the burial-ground is very spacious.

The town stands in a narrow valley on the left bank of the Jed. It consists of several streets, converging in the market-place in the centre of the town. There are several houses on the right bank of the river, forming a kind of suburb. There are three bridges over the Jed; and others over one or two small burns or brooks running into it, all in or near the town. The principal streets are sufficiently spacious; and though the houses have generally an air of antiquity, many of them are very good; and in the outskirts of the town are many pleasant villas. The county hall is near the market-place; and close to the southern end of the town, on an elevated site, is the county prison (including a gaol, bridewell, and debtors' prison, with a house for the governor), on a better construction than the generality of Scotch prisons. As it occupies the site of the antient castle of Jedburgh, it has retained the name of The Castle. There are three dissenting places of worship, two of them tolerably spacious. The dissenting interest is strong in and about Jedburgh.

The principal manufactures of the town are of woollens, such as blankets, flannels, tartans, shawls, shepherds' plaidings, hosiery, lamb's-wool yarn, and carpets: these branches give employment to between three and four hundred persons. There are an iron and brass foundry, and a factory for patent printing-presses. There are quarries of red and white sandstone in the parish and several corn-mills. Bread is made for the supply of the surrounding villages, and a great quantity is sent into the north of England. There are two branch banks. The markets are on Tuesday and Saturday; the Tuesday market is a well attended corn-market. There is a monthly cattle-market, and there are four horse and cattle fairs held in the year, besides a large sheep and wool fair at Rink, in a remote part of the parish. There is a post-office, and there is communication by coach daily with Edinburgh and Newcastle, and twice or three times a week with Hawick and Kelso.

Jedburgh is the seat of a presbytery, of the circuit court of Justiciary, and of Justice of Peace, Sheriff, and Small-Debt Courts. The corporate body of the burgh consists of a provost, four bailies, dean of guild, and eighteen councillors, four of whom are chosen from the deacons of the eight incorporated trades. The royalty or jurisdiction extends only over a part of the parish: it was somewhat enlarged for parliamentary purposes by the Reform Act. The burgh unites with Haddington, North Berwick, Dunbar, and Lauder to return a member. The business of the burgh courts is decreasing: the corporation have the management of part of the county prison.

There were, in 1834, fourteen day or evening schools in the parish, attended by 950 scholars, about one in six of the population; of these, 170 were attending the parochial school, with which the English school had been united. There are several excellent public libraries, one of them comprehending a valuable and extensive collection of books. There are two public reading-rooms and a reading society. There are a dispensary (for which the marquis of Lothian, in 1822, erected a commodious house, with baths and other accommodations), a savings'-bank, and some religious and charitable societies.

The neighbourhood is celebrated for the growth of apples and pears, an advantage which it owes to the excellence of the soil, and the care and intelligence of the monks of a former age. There are traces of a Roman camp, and of some other antient camps, of a Roman road, and some remains of the castles and towers of the middle ages, especially of Ferniehurst or Firnihirst Castle on the Jed, about two miles above Jedburgh, the antient seat of the Kers, ancestors of the marquis of Lothian.

Kelso is 11 miles north-north-east of Jedburgh, on the north bank of the Tweed, which receives the Teviot just opposite the town: the Tweed is at their junction about 440 feet wide, the Teviot 200 feet. The parish had, in 1831, a population of 4939, about one-tenth agricultural: it comprehends what antiently constituted three parishes, or parts of three parishes, and includes a portion of the antient burgh of Roxburgh, with the ruins of Roxburgh Castle, for some time the residence of the Scottish kings, and before which James II. of Scotland was killed, A.D. 1460. Kelso was famous for its abbey of Tironensis (a class of Benedictines), founded by King David I. early in the twelfth century. The abbey was repeatedly burnt or otherwise much injured, especially in the English invasions of 1523 and 1545, led by Lord Surrey and the Earl of Hertford (afterwards duke of Somerset) respectively. The town, which was originally little more than a suburb of Roxburgh, acquired greater importance from the foundation of the abbey, and rose rapidly after the decay of Roxburgh; but it was nearly destroyed in Hertford's invasion in 1545.

The town consists of several streets converging in an open square, and extends for about half a mile along the river Tweed, to which the principal street is parallel. The old houses, with gables to the street, have very generally given way to more modern buildings of freestone, roofed with slate, giving to the town a very handsome appearance, which is improved by the picturesque scenery of the surrounding country.

The ruins of the Kelso Abbey church are of mingled architecture: the predominant character however is Norman, more or less decorated, with some portions of early English intermingled. The building was in the form of a cross 99 feet long (the nave being shorter than the choir), with a transept 71 feet long and 23 feet broad, with a central tower 91 feet high. The ruins are considerable, and have been in the course of the present century cleared from some incongruous additions made to them in order to adapt the nave to the purpose of a modern church, for which it was used until late in the last century.

There are two modern churches: the one lately erected on the north side of the town is one of the most chaste and beautiful on the border; it is in the Elizabethan style, with a tower 70 feet high. There are five places of worship for dissenters. There is a bridge over the Tweed 494 feet long, with five elliptical arches of 72 feet span; the piers are 14 feet wide: it was designed by the late Mr. Rennie. [RENNIE.] The town-house is a neat modern building on the east side of the square.

The manufactures of Kelso are not important; leather, linens, stockings, hats, woollen cloth, and tobacco are manufactured; but all these branches give employment to no more than 150 men. There are four branch banks and numerous good shops. There are a daily market for provisions, a weekly corn-market, and a monthly cattle and sheep market, besides five yearly fairs, including that of St. James, one of the best-attended on the border. Professional men are tolerably numerous. There are races at Kelso: and rural sports of various kinds are much practised in the neighbourhood.

Kelso is a burgh of barony with a peculiar constitution: the baron bailie has jurisdiction in small matters, civil and criminal. There is a small prison or lock-up-house. The police of the town is inefficient, especially as the population has been deteriorated by an influx of gipsies from the neighbouring parish of Yetholm, and by the settlement of some Irish. There is a good deal of petty crime.

There is a post-office at Kelso; and communication is maintained by coaches with Newcastle and Edinburgh daily, and with Berwick, Jedburgh, and Hawick twice or three times a week.

There were, in 1834, ten day-schools, two of them parochial, namely, an English and a grammar school, three supported by private charity, and five private schools. The number of scholars, in 1836, was 664; it had been diminishing for the previous three or four years. There were also six Sunday-schools. There are three joint-stock libraries, of 5000, 2000, and 1500 volumes respectively; and several other libraries, a book-club, a Physical and Antiquarian Society, and two news-rooms. Two newspapers are published in the town.

There are a dispensary, with a house for receiving patients, furnished with baths, &c.; and a savings'-bank. Pauperism has much increased at Kelso.

Hawick is about 10 miles south-west of Jedburgh, on the right or south-east bank of the Teviot, at the junction of the Slitrig, Slitterick, or Slitridge, which flows through the town. The parish contains about 24 square miles, and had in 1831, a population of 4970. Hawick suffered much in the border warfare of former days; and both in the town and the rural parts of the parish are several towers or houses whose strength shows they were designed for fortifications. Among these, on the left bank of the Teviot, three miles above Hawick, is Branxholm, rebuilt by Scott of Buccleugh, its owner, after being almost entirely destroyed by the English under the earl of Sussex, A.D. 1570: the building has been so altered and repaired as to have lost much of its antient appearance, but it is of interest as occupying the site of the Branxholm, or Branksome, of Sir Walter Scott's 'Lay of the Last Minstrel.' The town consists chiefly of one long spacious street along the bank of the Teviot, which is here crossed by a stone bridge. There are two bridges over the Slitridge, one of them very antient. There are in the whole parish eight bridges. The streets are well paved, and lighted with gas. The general appearance of the town has been much altered of late years by the laying out of new streets and the substitution of better dwelling-houses and shops for those previously existing. The parish-church was built in the middle of the last century; it is destitute of architectural beauty, but in a good situation. There are four dissenting meeting-houses, a town-hall, and a suite of rooms used occasionally for public meetings.

The manufactures are chiefly of woollen yarns, flannels and other woollen under-clothing, plaiding, shawls, tartans, druggets, woollen-cloths of various descriptions, blankets, and lamb's-wool hosiery. In these branches, in 1838, [illegible] workpeople were employed in and round the town; and the annual consumption of wool was estimated at 108,000 stones; there were 11 extensive factories, 1209 stocking-frames, and 226 weaving-looms. A number of females were employed in sewing stockings. Machinery, candles, and gloves were also manufactured, and the tanning of leather and the dressing of sheep-skins were also carried on. There is a post-office. Mails to and from London and Edinburgh, by way of Carlisle, pass through the town; there are coaches to Edinburgh three times a week, and to Jedburgh and Kelso twice or three times. There is a weekly market on Thursday, and there are four yearly fairs for horses, cattle, sheep, and hiring servants, generally well attended.

Th[illegible] were in the parish, in 1839, a parochial school with [illegible] additional endowment; a second parochial school at [illegible] vill[illegible] of Newmill; and ten private schools; besides [illegible] bbath-schools on the local system, connected [illegible] ment, and four Sabbath-schools managed y dissent[illegible] he number of children in the day-schools [illegible], viz. [illegible]7 boys and 375 girls; there is scarcely any per- [illegible] native of the parish who is not able to read and write. [illegible]e are a public library of 3500 volumes, a trades' library [illegible] volumes, three juvenile libraries, and a school of arts. [illegible] are a savings'-bank, and several religious and charita- [illegible]ations. The police of the town is very inefficient; [illegible]s, embezzlements, and petty assaults are frequent. [illegible]peri[illegible] has increased of late years with more than ordi- ra[illegible]ity. Hawick is a burgh of barony; civil causes [illegible] extent and criminal cases of minor description are [illegible]e the burgh justices. There is a wretched prison [illegible] one room.

[illegible]se is on the south bank of the Tweed, 11 miles [illegible]st from Jedburgh. The parish has an area of 45 [illegible]re miles, and had, in 1831, a population of 4339, rather [illegible] -third agricultural. This parish appears to have [illegible] the seat of a religious community in the time of the [illegible] heptarchy; but the establishment was destroyed [illegible] the Scots obtained the district from the Northum- Sax[illegible] Some monks afterwards made it the place [illegible]eir t[illegible]orary residence; and, in A.D. 1136, David I. of [illegible] ded here a Cistertian abbey, the ruins of which [illegible] The original Saxon monastery was on a site [illegible] surrounded by the Tweed, three miles to the east of [illegible] of the later abbey. These ruins are well known [illegible] description in Sir Walter Scott's 'Lay of the Last [illegible].' They are chiefly of the abbey church, which was [illegible]e form of a cross; the length of the nave and choir was [illegible]8 feet, the breadth 79 feet; the length of the choir alone [illegible]out 50 feet; the length of the transept was 130 feet, the [illegible]adth 44 feet. The walls of the nave, choir, and transept [illegible]e standing, and part of the central tower. There are traces [illegible] the cloisters and of the monastic buildings. The beauty [illegible]d finish of the architectural decorations, and the majestic [illegible]nce of the ruins, altogether render Melrose an object [illegible] attraction. There are a few other antiquities in the [illegible]; the shaft of an antient cross in the centre of the vil- [illegible] surmounted by the crest of the earls of Haddington; [illegible] is a large barrow on the Eildon Hills, and a stone with [illegible]ient Latin inscription, evidently Roman, has been [illegible].

[illegible] town of Melrose consists of a central triangular [illegible] with streets diverging from it, and contains about 700 [illegible]tants, chiefly retail shopkeepers, handicraftsmen, or [illegible]ers, with their families. The place has an air of an- [illegible]; and some of the houses have in their walls stones [illegible]ptions derived from Catholic times. Some good [illegible] houses have been built. The church is on an emi- [illegible]e a short distance west of the town; it is a plain modern [illegible] with a spire. There are two stone bridges over the [illegible] in the parish, but neither of them near the town, [illegible] suspension-bridge for foot-passengers and single horses. [illegible]re are two dissenting meeting-houses, one in the town. [illegible]re is a small prison or lock-up-house, consisting of a [illegible] cell, secure, dry, and tolerably well ventilated.

[illegible]re is no manufacture but that of woollens. Some of [illegible]lishments connected with the manufacturing dis- [illegible] Galashiels extend into the western part of the pa- [illegible] The linen and cotton manufactures, which flourished [illegible] awhile, have become extinct, and the fisheries have [illegible]dled to nothing, but agriculture is conducted with [illegible]nd skill. The farms are large, and the farm build- [illegible]us and substantial. There are three yearly [illegible] cattle and sheep. There is a post-office, but no [illegible] through the town. The Edinburgh and Jedburgh [illegible]ses near it.

[illegible] are several schools in the parish; the parochial school, [illegible] or 80 scholars, being in Melrose itself, the others in [illegible]ling villages and hamlets. Education is gene- [illegible], and is much valued. There is a subscription [illegible] at Melrose, and there are small religious libraries [illegible] surrounding villages. There are a savings'-bank, [illegible]e friendly societies, and two missionary societies. Mel- [illegible] is a burgh of barony, but the powers conferred by [illegible] charter have never been exercised. The superior of [illegible]gh (the duke of Buccleugh) nominates a baron [illegible] whose deputy exercises a jurisdiction in trifling matters as a magistrate. Abbotsford, the residence of the late Sir Walter Scott, is in the parish of Melrose, two or three miles west of the town.

Castletown is in the southern part of the county. The parish is the most extensive in the south of Scotland, and comprehends a large part of Liddesdale. It is separated from the rest of the county by a range of hills, the ramifications of which, separated by narrow valleys, extend over the whole parish. The population in 1831 was 2227, about half agricultural. There are a number of antiquities; several circular enclosures, or antient British forts or camps, called 'Picts' works,' a druidical circle, several cairns, a stone cross, and the castle of Hermitage, with the ruins of the chapel near it. The castle is a massive border tower or fortress, nearly 100 feet square. The walls are entire, and have been lately put into complete repair. The town of Castletown consists of two long streets parallel to each other, lined with neat new houses, on the right bank of the Liddel, and contains a population of above 1000. The town was commenced in 1793, and has superseded the old village of Castletown (so called from a border fortress now demolished) higher up the vale. There are a weekly market established in the last two or three years, two yearly sheep-fairs, and three hiring-days. The parish church is at the junction of the Hermitage with the Liddel, above a mile from the town, and will contain 700 or 800 people. There is a dissenting meeting-house in the parish. There are four parochial schools, one principal and three auxiliary, besides two private schools, and a public subscription library. No public conveyance passes through any part of the parish.

The village of Yetholm, in the eastern part of the county, is remarkable as the usual abode of a gipsy colony, of which an account is given in 'Blackwood's Magazine,' vol. i., pp. 154-161. St. Boswell's, near Melrose, is celebrated for a great sheep-fair, the greatest in the county, held in July.

Divisions for Ecclesiastical and Legal Purposes.—Of the thirty-four parishes wholly or partly in Roxburghshire, nine in the north-east are in the presbytery of Kelso, nine along the north-western border are in the presbytery of Selkirk, one in the north (Smailholm or Smallholm) is in the presbytery of Lauder, and one on the south (Castletown) in the presbytery of Langholm. The remaining fourteen central parishes are in the presbytery of Jedburgh. The presbyteries of Kelso, Selkirk, Lauder, and Jedburgh are in the synod of Merse and Teviotdale; the presbytery of Langholm is in the synod of Dumfries.

The circuit court of justiciary and the sheriff-court are held at Jedburgh, where the county gaol is. There are six prisons in the county, viz.: the burgh and county prison at Jedburgh, and a small lock-up-house; and small prisons or lock-up-houses at Kelso, Hawick, Melrose, and New Castletown. 'There appears to be a good deal of crime in this county in proportion to the population. The offences consist chiefly of thefts (particularly sheep-stealing and embezzlement) and assaults . . . . The offenders as a class are said to be of drunken habits, and to be much below others in the same rank of life in education and intelligence. Many of the younger offenders have learned no honest means of getting a livelihood; and, as might be expected, their parents are themselves either positively bad, or at least very negligent of their children. The offences are chiefly committed by resident inhabitants; many however are by strangers. The police of Roxburghshire has been lately organised and greatly improved; but the procurator-fiscal is of opinion that about one-third part even of the offences which are of sufficient importance to be referred to the sheriff, are still committed without any clue being obtained to the parties concerned, or without sufficient evidence being obtained to warrant a prosecution.' (*Inspectors of Prisons' Third Report*, 1837.)

The county returns one member to parliament. Jedburgh is the principal place of election. The same burgh is united for the return of a member with Haddington, North Berwick, Dunbar, and Lauder. The constituency of the county amounted in 1834-5 to 1674, in 1835-6 to 1863, that of the burgh district in 1834-5 to 601.

History and Antiquities.—In the earliest period of authentic history the county seems to have been comprehended in the territories of two antient British nations, the Gadeni in the west, and the Otadeni in the east. Of these Celtic nations the cairns and barrows or tumuli, and other sepulchral antiquities which have been found, are supposed to be relics. Druidical stones, some of them arranged in circles, are found; and the Eildon Hills and other eminences are crowned with forts. On the conquest of this part of the island by the Romans, the county was comprehended in the province of Valentia, and Roman roads were carried across it, and Roman stations established within it. Some of these stations were formed by occupying the antient forts or hill-camps of the natives, and strengthening and adapting them by Roman skill and labour. The camp on the Eildon Hills was thus occupied. A chain of Roman posts may be traced by their existing remains, and there are traces of Roman roads. One, which was a continuation of Watling-street, may be traced from the Northumbrian border across the county near Jedburgh and Melrose, in the direction of Lauder. Coins, vessels of copper and brass, and other Roman antiquities have been discovered. The Trimontium of Ptolemy and Richard of Cirencester is fixed by some antiquaries at the camp on the Eildons near Melrose; but Chalmers places Trimontium at Birrenswork Hill in Annandale, Dumfriesshire, and makes the Eildon camp to be the Ad Fines of Richard of Cirencester, which others fix at Chew Green. Gadanica, mentioned by Richard, is fixed by some at Hawick. (See *Map of Antient Britain*, published by the Society for the Diffusion of Useful Knowledge.)

On the departure of the Romans this county was exposed to the attacks of the Angles, who founded the Northumbrian kingdom. The natives struggled long and gallantly, and it is to this period that Chalmers ascribes the construction of the Catrail, a vast ditch at least twenty-six feet broad, with a rampart eight or ten feet high on each side of it, formed of the earth thrown out of the ditch, extending from near Galashiels in Selkirkshire to Peel Fell on the border of Northumberland, forty-five miles, of which eighteen are in Roxburghshire. But the Angles gained ground, and before the end of the sixth century occupied Teviotdale, which became part of the kingdom of Northumbria. [NORTHUMBERLAND.] In the tenth century it was relinquished by the Anglo-Saxons to the king of Scotland, together with the rest of the Scoto-Northumbrian territory comprehended under the general name of Lothian. From this time the county was gradually strengthened by castles and towers against that hostility to which its situation on the border peculiarly exposed it. Jedburgh Castle was erected in the time of David I., in the earlier part of the twelfth century, and is the earliest in the county of which any distinct account can be given. Roxburgh Castle was perhaps of as early date, and at one time of greater importance. Hermitage Castle was built during the reign of Alexander II. (A.D. 1214-49); and in following years, but especially after the aggressions of Edward I. had embittered the hostility of the two nations, rose the various castles, towers, and peels, of which many ruins exist, and some of which have been brought into notice by the 'Minstrelsy of the Scottish Border,' and the poems of Sir Walter Scott.

Of Roxburgh Castle, now in Kelso parish; of Clintwood Castle, in Castletown parish; of Gossford Castle, in Eikford parish; and of Haliedean or Holydean Castle, in Bowden parish, the remains are very scanty. Of Delphiston Tower, in Oxnam parish, and Minto Tower, in Minto parish, there are rather more remains, also of Goldielands Castle near Hawick; but none of these call for particular notice. The ecclesiastical ruins, Kelso, Jedburgh, and Melrose abbeys, have been noticed already. There are remarkable caves at Jedburgh, Roxburgh, and Ancrum, which appear to have been used as habitations, probably as temporary retreats during the border wars. There are some remarkable remains of walls in Ancrum parish, forming a quadrangle, enclosing an eminence above which they rose; they are called the Maltan wall, and are supposed to be the remains of a building belonging to the Knights of Malta. Smallholm Tower is so conspicuous as to form a landmark for seamen entering Berwick harbour.

Roxburghshire appears to have been early established as a shire. Mention of the sheriff occurs in the reigns of Alexander I. (1107-1124) and David I. (A.D. 1124-1153). The chief fortresses in the shire were ceded to the English by William the Lion, to redeem himself from captivity, A.D. 1174, but restored A.D. 1189 by Richard I. When Edward I. seized Scotland into his own hands, he placed this county under a military administration; but the successes of Robert Bruce and his supporter Douglas, the latter of whom took Roxburgh Castle, A.D. 1313, restored the former mode of administration by a sheriff. The county was still however claimed, and at times successfully, by the kings of England, who occasionally appointed the sheriff, while in the intervals of English weakness and decline the Scottish princes exercised the right of appointment. In 1342 Roxburgh Castle, then in the hands of the English, was taken by Sir Alexander Ramsay of Dalwolsy, who was appointed by the Scottish king, David II., sheriff of the county. This appointment roused the jealousy of the great Douglas family, one of whom, Sir William Douglas of Liddesdale, seized the sheriff, and carrying him off to his castle of Hermitage, there starved him to death, A.D. 1343. In the interval between A.D. 1346 and 1384, in which year the Scotch again possessed themselves of the county, except the castles of Jedburgh and Roxburgh, Roxburghshire was in the power of the English. It was chiefly by the valour of the Douglas family that it was recovered, and the sheriffs were commonly chosen from that family, who came to regard it as their right, so that the appointment of Sir David Fleming of Biggar to the office, in A.D. 1405, led to his assassination by James Douglas of Balveny. The office of sheriff then became hereditary in the Douglas family, and continued so until the final abolition of hereditary jurisdictions. Roxburgh Castle was taken from the English, A.D. 1460, by Mary of Gueldres, widow of king James II., who had fallen during the siege; Jedburgh Castle had been recovered long before.

The calamities of war led to the ruin of the town of Roxburgh, which had, in the reign of David I., been the royal residence and the county town. On its downfall Jedburgh became, and has continued to be, the county town. The sheriffs appointed by the English made Hawick their residence. Liddesdale was possessed by various branches of the Douglas family, and passed by exchange, in 1492, to the earls of Bothwell. It was held by the notorious earl of Queen Mary's time, and she visited him when he lay wounded in his castle at Hermitage, in A.D. 1566. In the commencement of this unfortunate queen's reign, A.D. 1545, an English army, which had invaded the country under Sir Ralph Evers and Sir Bryan Layton, was here defeated with considerable loss by the earls of Arran and Angus. The county suffered materially in the succeeding invasions of the Earl of Hertford, afterwards duke of Somerset, A.D. 1545-1547; of Lord Gray, A.D. 1548; and of the Earl of Sussex, A.D. 1570.

(*New Statistical Account of Scotland*; Chalmers's *Caledonia*; Forsyth's *Beauties of Scotland*; Chambers's *Gazetteer of Scotland*; *Parliamentary Papers*.)

ROYAL ACADEMY OF ARTS IN LONDON. At the accession of George III., painting, sculpture, and architecture, notwithstanding there were eminent artists in all these branches, were in a lower state in Great Britain than in most parts of Europe. Foreign critics did not hesitate to assert, that the ungenial climate or the physical defects of the English presented insuperable obstacles to the attainment of excellence in the arts. Whether these opinions induced the young king to turn his attention to the subject, and endeavour to remove this national stigma, cannot now be known, but it is certain that he soon began to show a strong disposition to encourage the arts. The study of architecture under Mr. (afterwards Sir William) Chambers became his favourite recreation, and we have heard that his patriotic wish to advance the taste and refinement of the nation was strengthened by the representations and advice of Drummond, then archbishop of York. This prelate introduced to his notice Benjamin West, a young American artist just returned from his studies in Italy, to whom the king thenceforward allowed a liberal pension.

An institution which had been formed in 1754, called 'A Society for the Encouragement of Arts, Manufactures, and Commerce in Great Britain,' was the first which included among its objects the offering of rewards to the fine arts. Attempts were made about the same time by the principal artists to form a permanent academy for the cultivation of painting, sculpture, and architecture, which failed. In 1760 however, with the assistance of the above-mentioned Society, who liberally allowed the use of their great room for the purpose, the artists were enabled to open the first public exhibition, which though not entirely satisfactory to the promoters, attracted great attention, and was for several seasons successfully followed by a similar display of their talents. They were in consequence induced to apply to the king for a charter, which they readily obtained, and in 1765 ey were constituted a body corporate under the title of The Incorporated Society of Artists.' The way was thus aved for the institution of the Royal Academy; but its nmediate cause was a schism which took place in the 'Society' soon after their incorporation. According to Edwards whose 'Anecdotes of Painting' furnish the best accounts f the state of art at this period), 'Unfortunately they were carcely collected when discussions arose which, in the ourse of three years, caused an irreparable breach, and in he end a total dissolution of the incorporated Society.' This t he attributes 'to the loose and unguarded manner in h the charter was composed: for it did not provide st the admission of those who were distinguished er by their talents as artists nor their good conduct as u.' The number of members already amounted to a lred and forty-one, of whom a large portion were artists very inferior merits. 'It was now seen,' says another riter well acquainted with the facts, 'that no society of his kind could be lasting, unless it were more limited in s numbers and select in the choice of its members, and at it could have no national dignity without the avowed nd immediate patronage of the sovereign.' Accordingly e principal artists withdrew, and endeavoured to obtain e protection and patronage of the king. W. Chambers, . Coates, G. M. Moser, and B. West presented to him a emorial signed by twenty-two artists, the purport of which as to show the probability that with his royal sanction and ouragement, and by means of an annual exhibition of eir works, they would soon be able to raise sufficient nds for the support of a gratuitous national school of art. he memorial stated, 'The two principal objects which we e in view are the establishing a well-regulated school or ademy of design, and an annual exhibition open to all ists of distinguished merit; we apprehending that the ofits arising from the last of these institutions will fully swer all the expenses of the first; we even flatter ourlves that they will be more than necessary for that purse, and that we shall be enabled annually to distribute mewhat in useful charities.' The proposal was graciously ceived. The plan of a constitution was draw up by Mr. hambers, and laid before the king, which he approved, d signed on the 10th of December, 1768. Thus was unded 'The Royal Academy of Arts in London, for the rpose of cultivating and improving the arts of painting, ulpture, and architecture.'

The artists who signed this memorial were: Benjamin est, Francesco Zuccarelli, Nathaniel Dance, Richard ilson, George Michael Moser, Samuel Wale, J. Baptist ipriani, Jeremiah Meyer, Angelica Kauffman, Charles otton, Francesco Bartolozzi, Francis Cotes, Edward Penny, eorge Barrett, Paul Sandby, Richard Yeo, Mary Moser, gostino Carlini,, William Chambers, Joseph Wilton, rancis Milner Newton, Francis Hayman. These, with ohn Baker, Mason Chamberlin, John Gwynn, Thomas ainsborough, Dominick Serres, Peter Toms, Nathaniel one, Joshua Reynolds, John Richards, Thomas Sandby, eorge Dance, Francis Hayman, William Hoare of Bath, d Johan Zoffani, composed the original thirty-six academicians. The number forty was not completed till 1780— the addition of Edward Burch, Richard Cosway, Joseph ollekens, and James Barry. Their first meeting was held n the 14th of December, when the following officers were lected, viz.: J. Reynolds, *President;* G. M. Moser, *Keeper;* Newton, *Secretary;* E. Penny, *Professor of Paint-* T. Sandby, *Professor of Architecture;* J. Wall, *Pro-* *r of Perspective;* Dr. William Hunter, *Professor of* *my.* The king appointed William Chambers *Trea-* r, and R. Wilson *Librarian.*

his list of the founders of the Royal Academy evidently des the great mass of talent existing at that period in ondon.

The other academies of Europe which have been established for the advancement of the fine arts and the promotion of public taste, are supported entirely at the expense of their respective governments as *national* objects, and are usually under the control of some person of distinction. Such is the Royal Academy of Paris, founded just a century before. The Royal Academy of London is essentially different from these, inasmuch as it originated in the private munificence of the reigning king, and, since the first years of its existence, has been entirely maintained by the exertions of the artists themselves, unaided by a single national grant or public subscription.

The king's adoption of the artists was immediately followed by the most liberal and effective support. He caused apartments for the schools to be fitted up in his own palace of Somerset House, supplied the Society with rooms in Pall Mall for their exhibitions, and for several years made up every deficiency in their expenditure from his privy purse; with true and considerate benevolence he allowed them at the same time to reserve a hundred pounds a year to form a fund for necessitous members or their widows, and twice that sum to administer occasional relief to artists in distress, whether they were members of the Society or not.

George III. constituted himself the head of the Academy, and showed a personal interest in its success; he gave frequent audiences to its officers, confirmed its proceedings when his sanction was necessary, and attended to all its concerns as if it were part of his household. When Old Somerset House was purchased by the nation as a site for a number of public offices, the king took care to reserve a portion of the new building for his Academy.

In 1776 the plans of a new site were submitted to the approval of the president and council, and the apartments devoted to this purpose were fitted up with a degree of magnificence worthy of a royal palace, the talents of many of the principal members having been employed in its decoration. In July, 1780, the preparations being completed, the Royal Academy obtained possession of their new residence, by an order from the Treasury to the surveyor-general of the works, and their first exhibition in Somerset House took place in the following year. This friendly superintendence of its affairs and anxious desire to promote the welfare and utility of the Society continued till the year 1800, when the health of the king unfortunately became so much impaired as to prevent any further interviews between the Academy and its patron. But the institution had now acquired stability, and though its acts for some time remained unconfirmed, it continued to exercise its functions; and when the government was placed in the hands of the Prince Regent, he took the Academy under his protection, and approved of their proceedings. On his accession to the throne, in 1820, the position of the Academy had become somewhat changed. A gradual augmentation in the receipts of the annual exhibitions, aided by a judicious economy, had enabled the members to support the schools on an increased scale of expenditure, and to provide for the continuance of the establishment from its own resources, without the assistance of the king. On the death of George III., the Academy solicited his successor to honour them with the same patronage which they had received from his predecessor. George IV. readily consented to adopt the Royal Academy, and, in furtherance of the views of its founder, placed himself at the head of the institution, and thenceforward gave the sanction of his signature to such of their proceedings as required it

Though the Society did not derive any pecuniary assistance from George IV., they were on many occasions indebted to his munificent patronage. He honoured the president with a distinctive badge, a gold medal and chain, to be worn on all public occasions. He presented them with a magnificent lamp for their principal room, and greatly forwarded the utility of the schools by giving them a large and highly valuable collection of casts from the finest antiques, which were procured from Rome by the intervention of Canova.

On the death of George IV., his successor, William IV., immediately extended his patronage to the Royal Academy. He entered cordially into the views of his royal father, received the officers with promptness, and attended with great kindness to their wishes on all occasions.

In 1834, a proposal having been made by Lord Grey and the existing ministry to transfer the establishment from Somerset House to Trafalgar Square, where an edifice was proposed to be raised which would be large enough for a national gallery of paintings, and at the same time offer better accommodations to the Royal Academy, the king was appealed to on the subject. At first he seemed rather adverse to the removal of the Society from apartments which he considered to be his own, where they had been planted by their founder, and where they had carried on their operations with success for above half a century, but on being informed that it would probably conduce to the advantage of the arts that the Society should have better exhibition-rooms, particularly for works of sculpture, he consented, though with some reluctance, to the exchange proposed.

Plans of the new building were accordingly laid before the president and council, and the accommodation of the Academy was consulted as far, we may suppose, as circumstances would permit, but it appears that some inconveniences of a very serious kind could not be overcome. The apartments were put into their possession in 1836, in a very unfinished state, and wholly devoid of such decoration as might have been expected in an academy of the arts. The removal has been attended with great expense to the Society, and in many respects they have been disappointed in their expectation of improved accommodation.

Upon the accession of Her present Majesty, and a representation of the position of the Academy with relation to her royal predecessors, the queen adopted the Royal Academy, consented to become its head, to grant the same privileges of a private audience to its officers, and to sign such of their proceedings as require the royal sanction.

The Royal Academy consists of forty academicians, painters, sculptors, and architects. There is a second order of members, styled associates, twenty in number, from whom alone the vacancies that occur among the academicians are supplied. The body of academicians elect, but the approbation and signature of Her Majesty are necessary to make this election valid.

There are also six associate engravers. Associates are elected by the body of academicians, from a list of exhibitors who declare themselves candidates for this honour.

There are a treasurer and a librarian. A bye-law of the Academy requires that they shall be academicians. These offices are filled by Her Majesty's nomination.

There are also a keeper and a secretary. These offices are filled by election, with the approbation of Her Majesty.

There are four professors, academicians, elected by the general assembly, and approved by the queen, who read lectures on painting, sculpture, architecture, and perspective.

There is a professor of anatomy, elected by the academicians, with the approbation of Her Majesty.

There are three schools: a school for study from casts from celebrated works of antiquity; a school for study from living models; and a painting school. The first is under the care and direction of the keeper; and the other two are under the care of visitors, annually appointed.

The council consists of nine members, including the president, and has the management of all the concerns of the Society. All bye-laws of the Academy must originate in the council, and have the approbation of the general assembly, and the sanction of Her Majesty's signature to give them effect.

The president, council, and visitors are annually elected, and confirmed by Her Majesty's signature.

There are also several honorary members of the Royal Academy, namely, a professor of antient literature, a professor of antient history, a chaplain of high rank in the church, an antiquary, and a secretary for foreign correspondence, elected by the general assembly and approved by the queen.

Among the honorary members are the names of Samuel Johnson, Goldsmith, Franklin the translator of Sophocles, Gibbon, Mitford the historian of Greece, Barretti, Bennett Langton, Dr. C. Burney, Walter Scott, and others.

All persons are admissible as students of the Academy. Nothing but indication of talent and a respectable character are required from them. Their names remain unknown till judgment is passed on the specimens which they send in, and when admitted they receive a gratuitous education from the best masters.

All painters, sculptors, or architects, whose works show sufficient merit, are allowed to exhibit with the Academy, and, being admitted exhibitors, they are immediately eligible as associates. Many young artists whose great abilities have promised to contribute to the credit and support of the institution, have been chosen associates, and soon afterwards academicians, though they had scarcely left the schools.

The executive government of the Academy passes in rotation to all the academicians, and half the council retires, and is renewed annually.

The operations of the Academy are continued in regular succession throughout the year, excepting vacations of a month in September and a fortnight at Christmas. Unfortunately the necessity of giving up the only room fit for an antique academy to the annual exhibition of sculpture, renders the cessation of that school during the exhibition still unavoidable.

The schools of drawing, painting, and modelling are open daily from ten to three and from six to eight, under the direction of the keeper and visitors. A practical course of lectures on perspective is given during the spring. The lectures on anatomy are delivered before the Christmas recess; those on painting, sculpture, and architecture, are given twice a week, from January to the end of March. The library is open three times a week.

Prizes are annually given to encourage meritorious students, and those who have gained the biennial gold medal have from time to time an opportunity of being sent abroad to study for three years at the expense of the Academy.

Among the chief improvements in the practical working of the Academy, besides the professorship of sculpture, may be reckoned the institution of a school of painting, which is under the superintendence of a special officer. It is attended twice a week by visitors, who are appointed from among the academicians for that purpose, and premiums are annually awarded to the successful students. This school is from time to time favoured with the loan of some of the finest pictures from the royal collections, from the Dulwich Gallery, and from all the principal collections of the metropolis, which are during the greater part of the year placed before the students. For the furtherance of this object the Academy have purchased the finest copy extant of Leonardo da Vinci's celebrated Last Supper.

The library of the Academy is continually improving, and it now contains all the best works on art, besides a considerable number of modern prints and a valuable collection of engravings of the Italian school from the earliest period, formed by George Cumberland, for which they paid 600*l.* On the death of Sir Thomas Lawrence the Academy purchased his collection of architectural casts for 250*l.* (although their apartments could not accommodate them), and presented them to the British Museum, where they are well arranged for the benefit of students.

The question has often been raised, whether academies are calculated to advance the arts; but these institutions vary so much in their plan and character, that any a [illegible] to this question must depend on the precise meani [illegible] attached to the word. Academic education will probably be less effective than the education obtained under a master of eminence who is daily teaching his pupil by precept and example in his own studio; but an academy, considered as a school of art, is just as likely to stimulate genius as a private school, if it is well conducted. The great men who have been brought up in private schools would not h [illegible] been less eminent if they had been reared in an aca [illegible] which term properly means a place of instruction, a [illegible] which offers every opportunity of study. If such schools cannot create genius, they have no tendency to stifle it. Sir J. Reynolds always regretted that he had not had a more academic education. The school of the Caracci sent out a number of well-trained and excellent artists, though they had not the good fortune to produce a Raffaello. The fact is, that the true school of any country is in the mass of talent existing in it, and not in the studio of any particular artist.

It is only the elementary education that can be acquired in a school of any kind, but this is precisely the kind of education which a well-constituted academy can give better than any private master. The utility of such an establishment as the Royal Academy cannot therefore be doubted; and it must be from want of diligence or capacity, or both, if, with such numerous aids and advantages, the students do not acquire sufficient preparatory knowledge to enable them fairly to commence their profession.

If we look back to the general condition of painting, sculpture, and architecture when the Royal Academy of Arts was established in 1768, they will be found to have made at least as great a progress here as they have [illegible] any other country in an equal period. In many [illegible] English may vie with any modern school of painti [illegible] in colour and effect it confessedly stands alone, and has [illegible] a model to the rest of Europe. It is characterised by [illegible] nality and a great variety of styles, and it has produced [illegible] works of first-rate excellence. In portraiture, familiar subjects, animals, and landscape it is unrivalled. In historical painting alone, from the want of national encouragement, it has not been so successful. This branch of art can only be kept alive by public encouragement, and by the decoration of churches, palaces, and other public buildings, a subject to which the government of this country have hitherto paid or no attention. About two thousand students have reared under the tuition and auspices of the Royal emy. Among these the well-known names of Bankes, nan. Nollekens, Deare, Bacon, Rossi, in sculpture; e, J. Wyatt, Wyatville, in architecture; Northcote, Hoppner, Lawrence, Westall, Stothard, and Hilton, in ing, are conspicuous. Some of these artists are en- to be ranked with the best of any period of art, and s gave proof of powers which, if they had been em- d in national works, might have raised English art to higher elevation. This list might be much enlarged could with propriety include in the enumeration the s of living artists. The creation of so large a number l-trained students has tended to diffuse a love for the hroughout the country, and given rise to institutions eir cultivation in many parts of the empire. Thus the taste has been improved, and those branches of our facturing industry which require the aid of the art of have been indirectly encouraged by the establish- of the Royal Academy.

ong the benefits derived from the institution of the Academy may be mentioned the various lectures and rses which have been delivered there. The discourses ynolds are highly appreciated both at home and l; and the lectures of Fuseli, Flaxman, and other sors have established the theories of their respective a sure basis.

attention which the Royal Academy has uniformly to unfortunate artists in general, and the liberal as- ce they have bestowed to such out of their funds, l not be omitted. It appeared in evidence before a ittee of the House of Commons, in 1836, that the sum that they have expended in pensions to distressed ers amounted to 11,106*l*., and the donations to artists, ers, and their families, to 19,249*l*. With this sity the Academy has combined a prudent degree of ny in the management of their funds, both for the se of providing against casualties and for the gradual vement of the establishment. This is shown by the at they have already expended 240,000*l*. in carrying he objects for which they were associated, and have eserved for exigencies a sum of 47,000*l*. stock.

ill appear from what has been stated, that the Royal emy owes its corporate existence entirely to the crown, neither supported nor aided by any public funds. It lso been shown in what manner it has become en- to accommodation in the National Gallery. Though ertions of the Academy have been directed to a public — the improvement of the arts—it differs in no respect any other body incorporated for literary or scientific ses, such as the Astronomical Society for instance, and which support themselves by their own funds. Ac- gly it is not easy to see on what grounds the House of nons claim the right of inquiring into the receipts, ex- ture, and general management of the Academy. The tee of the House of Commons on Arts and Manufac- n 1836, did however inquire into the affairs of the emy, and the printed evidence reported by the com- shows that every information was readily given to The result of the inquiry was in every way creditable institution, and the administration was proved to be y conformable to the purposes for which the Academy stituted.

the year 1834 the House of Commons had addressed ing, requesting him to direct the Royal Academy to h them with certain returns explanatory of the con- ion of the body and its proceedings.

is was the first attempt to withdraw the Royal Acade- its immediate connection with the crown and to under the control of the House of Commons. On ccasion the Academy, having first asked the permis- of the king, William IV., gave the House all the in- ation that was desired. But in 1839 an order was to furnish the House with similar returns in continua- as well as with the particulars of their domestic ex- iture. These returns were not made, and a petition presented to the House, in which the position and of the Royal Academy were fully and clearly ex- The petition produced its effect, and the order was ued.

e have purposely abstained from any notice of the us attacks made on the Royal Academy. Its consti- n and administration are now so well known, that it is not very difficult to form a right judgment of what is said either for or against it. Those who find fault with its constitution, should show how it can be improved, and those who would deny that it has done service to the arts, must be prepared to dispute the truth of a large part of the petition just referred to. The administration of the finances of this body deserves unqualified praise. It has itself produced all the funds necessary for its support, and by a rare combination of liberality and economy it has expended large sums on proper objects, and yet is far from being poor. There are few public bodies of which the same can be said.

ROYAL EXCHANGE. Although there is no such building actually existing at present, we insert here some account of the one destroyed by fire in 1838, which was the second structure the original one having met with a similar fate in the Great Fire of London in 1666. The first edifice, which was a brick building, was erected by Sir Thomas Gresham, for the accommodation of the merchants, entirely at his own expense. [GRESHAM.] Notwithstanding the general confusion and trouble occasioned by the calamitous conflagration, the new Exchange was commenced at the end of the following year, and was so far advanced in 1669, as to be publicly opened for business, on September 28: a rather curious circumstance, when it is considered that more than the same time has elapsed since the last fire, and the future Exchange can hardly be said as yet (March, 1841) to be actually begun.

The design of the late Royal Exchange had always been attributed to Wren, until Mr. Brayley claimed it for Mr. Edward Jerman, who was one of the city surveyors at that time, and who, it appears, was employed by the committee to conduct the works, which, however, is no proof whatever that he was the author of the design. On the contrary, as that point is left doubtful, the more plausible conjecture is that he was not; because, had he been so, his name would in all likelihood have been less obscure, if only on account of that single production, for it was certainly looked upon at one time as a splendid structure. It is for such reason alone that we call in question Jerman's title to be considered the real architect, since we are not at all solicitous to claim that honour for Wren, being of opinion that it was in many respects not a little barbarous in taste, and that Ponz [PONZ], certainly not the most fastidious of critics, did not do it any very great injustice when he spoke of it, in his account of his tour in England, as being totally devoid of elegance in its decorations. The large order of four Corinthian columns, in the centre of the Cornhill front, was so managed as to disturb the whole design, for instead of its architrave being upon the same level as that of the smaller order on each side over the arcades, it was lower down; consequently, besides the disagreeable irregularity so occasioned, that portion appeared depressed, although made actually loftier than the rest by the attic and tower. Another very singular solecism was, that over the intercolumn on each side of the large central archway there was a segmental pediment most unmeaning in purpose and insignificant in effect, or rather, the only effect was to make us sensible of the omission of a central pediment in the design. Over the archway or middle compartment the clock-tower was carried up in three receding and diminishing stories or stages, in each of which was an arched window, and at the angles a Corinthian half-column grouped with a semi-pilaster on each side, similar to the small order over the arcades in the lateral divisions of the front; and so far there was some uniformity kept up between those portions of the design and the tower. There were also at one time two ugly octagonal lanterns with ogee domes, not at the extremities of the front, but over the extreme compartments where the arcades projected beyond the general plan. When those turrets were removed we have not been able to ascertain; but the larger tower was taken down, and a new one erected, about 1821, by Mr. George Smith, architect to the Mercers' Company, at which time other alterations were made in the upper part of the central compartment, and among them was that of substituting balustrades, with statues on their pedestals, for the two small pediments above mentioned. Immediately behind these balustrades rose an attic, containing a large pannel with bas-relief, flanking the loftier stylobate or lower story of the tower, to which succeeded a low octagonal base, with clock dials on its faces, supporting a circular Corinthian peristyle of eight columns, crowned by a dome. This arrangement seems to us much better than that of the first tower, with its three square chest-like stories dwindling upwards into insignificance. Still there were two circumstances which detracted considerably from the merit of the second or circular story of the last tower: one, the absurdity of introducing balustrades between the shafts of the columns when there was no passage behind them; the other, the introducing stumpy arched windows squeezed into all the intercolumns.

The chief merit of the inner quadrangle was, that it afforded a spacious sheltered ambulatory (28 feet wide) round the open area: in point of architecture it was poor, and in some of its features very offensive. The lower and much better half consisted of seven arches on each of the longer sides, and five on each of the shorter sides of the open area, springing immediately from the capitals of the Doric columns; those at the angles of the plan had clustered shafts. But the beauty of such a combined ordinance was materially injured by the great span of the arches in comparison with the height of the columns. This scantiness of the columniation, and consequent apparent fragility of the lower part, was rendered more offensive by the heavy superstructure over it. This last was of barbarous design, in proof of which it is sufficient to observe that the architrave was cut through by ugly little oval windows, just at the vertex of each arched compartment, where, if anything, there ought to have been some kind of keystone.*

These remarks have been more minute than may seem consistent with an article of this kind; yet the subject derives from circumstances far more interest just now than it would else possess. We shall not say anything with respect to the competitions for the new Exchange, except that the last, to which only six architects had been invited, was confined to Mr. Cockerell and Mr. Tite, and that the design by the latter was selected for execution. It would be altogether premature however to attempt any description of what will probably undergo considerable modifications in many parts, for it is said that the western portico (a Corinthian octastyle) is now to be extended so as to be *diprostyle*, instead of *monoprostyle*. [PORTICO.] It is singular that the opportunity should not now be taken of covering in the area where the merchants assemble, instead of forming, as before, a mere court with colonnades around it, where the open area at least must be exposed to the weather. Every edifice of the kind erected within the last century is covered in: the Royal Exchange, Dublin, the Bourse at Paris, the Exchange at Hamburg, that at New York (since destroyed by fire), and the Birzha or Exchange at St. Petersburg. Though small, the first of these is singularly elegant in its plan, the interior forming a rotunda within a square, having a circular peristyle of twelve Corinthian columns supporting a dome over the central part of the area below. For some account of the Bourse in that capital we refer to PARIS. The Birzha at St. Petersburg, on the contrary, calls for some little notice here: it is an insulated edifice surrounded by a Doric peristyle, forming nine intercolumns at each end and thirteen on each of the longer sides. As the *cella*, or body of the edifice enclosed by the colonnades, is carried up rather higher than these last, there are no pediments over the ends or fronts, though the ends of the cella terminate in a pediment outline, and have a large semicircular arch serving to light the interior or salle, which has also a lantern in the centre of its semicylindrical roof.

We here subjoin the dimensions of the late Royal Exchange, with those of the intended structure, &c.

Old Royal Exchange. Extreme external dimensions 210 by 175 feet. Interior quadrangle 155 by 118 feet, or 18,290 square feet. Open area of quadrangle 99 by 75 feet, or 7425 square feet.

Plan of New Exchange. (By Mr. Tite.) Extreme length from east to west, including portico, 293 feet; breadth at east end 175 feet; interior quadrangle 170 by 113 feet, or 19,210 square feet; open area of quadrangle 114 by 57 feet, or 6398 square feet.

Exchange, St. Petersburg. Built 1804-10. Exterior 330 by 246 feet. Salle 190 by 90 feet, or 17,100 square feet.

Bourse, Paris. Exterior 234 by 164 feet. Salle or interior covered area 108 by 59 feet, exclusive of galleries, or 6372 square feet.

ROYAL SOCIETY (*of London*), consists of a number of persons associated together for the purpose of promoting mathematical and physical science. At its formation the more particular object of the members was to assist each other in extending their knowledge of natural and experimental philosophy.

Philosophical societies for the cultivation or advancement of particular branches of human knowledge existed, both [illegible] the Continent and in this country, before the end of the sixteenth century. In Italy, the Florentine Academy and the Academia della Crusca had been founded with the view of improving the language and literature of that countr[illegible] France had its Academy of Painting and Sculpture, Royal Academy of Inscriptions; and the Antiquarian in England was founded in 1572. With the excep[illegible] the persons connected with these institutions, who [illegible] gaged in the pursuit of letters, the fine arts, and [illegible] the learned world was in that and the prec[illegible] chiefly occupied with scholastic philosophy. But [illegible] coveries of Galileo in astronomy and mechanics opened a field for research in those sciences, men o[illegible] ing began to turn to pursuits which, while they [illegible] constitute a worthy exercise of human intellect, to lead to results of great practical utility.

England appears to have led the way to the fo[illegible] a body of men who sought by mutual co-operation to [illegible] the *new philosophy*, as it was called; for Dr. Wal[illegible] account of his own life, relates that in 1645, wh[illegible] therefore have been while the civil war was [illegible] country, several persons who then resided in [illegible] the suggestion of a Mr. Haak, a native of Germany, [illegible] themselves into a club, in which, purposely excluding [illegible] and theology, they agreed to communi[illegible] to [illegible] the results of their researches in chemi[illegible], [illegible] metry, astronomy, mechanics, magnetism, [illegible] experimental philosophy in general. Among [illegible] first met for this worthy purpose, were Drs. Wilkins, [illegible] Goddard, Ent, and Glisson, and Messrs. Haak and F[illegible] (the professor of astronomy at Gresham College); and place of their meeting was generally at Dr. Goddard's l[illegible] ings, but they occasionally assembled in Gresham Coll[illegible] in its neighbourhood. This is supposed to be the club [illegible] Mr. Boyle, in a letter (1646), designates the invisible philosophical society.

Before the year 1651, Drs. Wilkins, Wallis, and Godd[illegible] having obtained appointments at Oxford, [illegible] that city, where, being joined by Drs. Seth [illegible] Petty, and Willis (the last an eminent ph[illegible] Mr. Rooke, they constituted themselves a society [illegible] that which they had left in London. They met [illegible] Dr. Petty's lodgings, which were in the house of [illegible] cary, where they had access to such drugs as they [illegible] to examine; and as often as any of the members had [illegible] sion to visit the metropolis, they did not fail to attend meetings of their former associates. When Dr. Petty [illegible] to Ireland in 1652, the meetings at Oxford appear to [illegible] been for a time suspended; for that gentleman, [illegible] from Dublin to Mr. Boyle, in the beginning of 1[illegible] presses his gratification that the club was revived; the same year the members met either at the apartm[illegible] Dr. Wilkins in Wadham College, or at the lodgings of Mr. Boyle. It appears however that, in the beginning of 16[illegible], all of them except the latter gentleman, who continued to reside at Oxford till 1668, came to London, where they joined the friends who had remained there, and [illegible] united clubs were almost immediately strengthened [illegible] accession of several new members. At that time the [illegible] tures on astronomy and geometry in Gresham College were delivered, the former by Mr. Christopher Wren, on every Wednesday, and the latter by Mr. Rooke (who had b[illegible] appointed in 1652), on every Thursday; and [illegible] men, together with Lord Viscount Brouncker, [illegible] (afterwards Lord Brereton), Sir Paul Neile, Mr. [illegible] Mr. Balle, Dr. Croone, and others, besides the Oxford [illegible] bers, used after the lectures to assemble for philos[illegible] conversation in an adjoining room. This state of thi[illegible] not however continue long, for during the same [illegible] consequence of the troubles which ensued on the r[illegible] tion of the Protectorship by Richard Cromwell, the [illegible] ments which had been occupied for scientific purpo[illegible] converted into quarters for soldiers, and the m[illegible] of the society were obliged to disperse.

We learn also from Dr. Wallis, that upon the restoration

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* That we do not borrow our opinion from Ralph, who is generally quoted as an oracle on the buildings of London, is evident, for he says that the quadrangle is 'laid out in a very good style, and finished with *great propriety of decoration*.' Another writer assures us 'there are many beauties in the architecture, and but few defects. The *four orders* (?) of the quadrangle are magnificent, and richly decorated with the basements (?), arches of the walks, the cornices over them, niches, statues, pillars, circular windows, entablature, pediments, and balustrade, *all in correct proportion and arrangement*.'

meetings were revived; and on the 28th of
that year, the members came to a resolution
uld assemble during term-time in Mr. Rooke's
Gresham College, and during the vacation at
ambers in the Temple. It was further resolved
nbers should constitute themselves a society
physico-mathematical learning, similar to the
ociations of men for other branches of know-
gn countries. At this time also a series of
lating to the objects proposed by the society
p, and of these the following is a brief outline:
eed that records should be made of all the
re and art of which any account could be ob-
at the present age and posterity might be able
errors which have been strengthened by long
to restore truths which have long been ne-
to extend the uses of those already known;
the way easier to those which are yet unknown.
resolved to admit men of different religions,
nd nations, in order that the knowledge of na-
freed from the prejudices of sects, and from
ur of any particular branch of learning, and
ind might as much as possible be engaged in
philosophy, which it was proposed to reform,
and ceremonies, but by practice and example.
r resolved that the Society should not be a
some might teach and others be taught, but
of laboratory where all persons might operate
of one another. Lastly, it was resolved that
should subscribe his name to an agreement
d constantly attend the Society's meetings, if
l by illness or some indispensable business;
d pay ten shillings on his admission, and that
scribe one shilling weekly while he continued
he Society; but from this obligation he was to
e chose to withdraw. At the same time Dr.
hosen chairman, Mr. Balle, treasurer, and Dr.
rar. It was agreed to meet every Wednesday,
clock in the afternoon.

e thus raised from the members was intended
Society to accomplish the various objects for
instituted, and particularly to defray the ex-
philosophical experiments which it was pro-
. The intention was, that persons should be
abroad, for the purpose of collecting informa-
ers should remain in London, and present the
ir researches at the weekly meetings. It was
hat the members should be formed into com-
e consideration of the subjects which were to
by experiments, and that the performance of
uld be assigned to persons who, by their parti-
were best qualified for the duty. Some of the
were to be appointed to examine all works on
story of foreign countries, that out of them they
e directions as a guide in making inquiries
he phenomena of the atmosphere and the cur-
sea, and in performing experiments on light,
c. It was proposed to bring the results of
s into one common stock, and to consign them
ers for the benefit of future generations,
to any order in the arrangement; it being
at if subjects of a like nature were brought
ons might be tempted too early to form gene-
which might be detrimental to the progress of
(Dr. Sprat, *History of the Royal Society.*)

the plan and constitution of the infant Society,
stined, in its maturity, to hold so distinguished
e annals of science. Its first recorded steps,
lace Dec. 5, 1660, consisted in appointing Mr.
next weekly meeting, to perform an experi-
vibrations of pendulums, and Lord Brouncker
series of instructions for conducting some ex-
elating to the temperature, moisture, &c. of
performance of which on the Peak of Teneriffe
ed to procure.

erwards it was resolved that persons desiring
d should be recommended by some member,
election should take place by ballot. No one
nk of a baron was to be admitted without a
l the number of members was to be limited to
hom twenty-one were to be a quorum for elec-
e for other matters. It was agreed also that
the Royal College of Physicians and the professors of mathematics and natural philosophy in both universities should, if they desired, be admitted as supernumeraries on paying the fees and lending their assistance when convenient. The restriction respecting the number of members was however soon afterwards taken off; and, at this time, candidates who were proposed on one evening were often admitted at the next, or at the second following meeting, though the practice respecting the interval between the application and the admission seems to have been very variable. The president or chairman held his post sometimes during the evening only, sometimes he was appointed for a month, and he was occasionally re-elected. Two persons were appointed to superintend the arrangements for performing the proposed experiments, and one of the members acted as a reporter at the meetings. An amanuensis for copying minutes, and an operator under the superintendents, were engaged as servants, and received salaries.

In that age, the constitution and qualities of material bodies being very imperfectly known, suggestions founded on ill-observed phenomena, and the marvellous relations of credulous travellers, were often thought deserving of consideration from the bare possibility that they might lead to the discovery of useful truths; and this circumstance may serve to account for the apparently absurd inquiries and experiments which appear in the notices of the Society's first labours. Thus, in 1661, Mr. Boyle was requested to ascertain the name of the place in Brazil where there was said to have been a kind of wood which attracts fishes; he was also desired to inquire into the truth of the circumstance mentioned by Schotter—that a fish suspended by a thread would turn towards the wind. And in the same year, the opinion that a spider could not get out of a space enclosed within a circle formed of powdered unicorn's horn was actually made the subject of an experiment. The philosopher will however forget these early occupations of the Society when he meditates on the works of a Newton and a Davy, which are also recorded in the pages of its history.

The Society having presented an address to the king (Charles II.) on his restoration, his majesty expressed much satisfaction that the institution had originated in his reign, and promised to support it with his influence. And, in 1662, by the concurrence, it is said, of Lord Clarendon, the chancellor, Sir Geoffry Palmer, the attorney-general, and Sir Heneage Finch, the solicitor-general, he granted a charter, by which the members were incorporated into a Society consisting of a president, council, and fellows, under the name of the Royal Society. In this they were declared capable of holding lands, tenements, &c. in perpetuity or otherwise, and of suing or defending in any court of law; a coat of arms was given them, and they were allowed to have a common seal for their use. William Viscount Brouncker was appointed president, and twenty-one persons were appointed by name to form a council. It was further regulated that the president should be elected annually on St. Andrew's day, and that ten of the council should, at the same time, be replaced by ten other persons chosen from among the fellows. (Birch, *History of the Royal Society*, vol. i.) This charter being found not sufficiently explicit, in the following year another was obtained, in which the president and fellows are designated the President of the Council and the Fellows of the Royal Society of London for promoting natural knowledge; and in which, after declaring that the Society might hold lands, &c., there is added 'Statuto *de alienatione in manum mortuam* non obstante.' (Birch, *ut sup.*) Between 1661 and 1664, the king made several visits to the Society, and on those occasions experiments were exhibited, for the preparation of which committees of the members were appointed. In 1663 his majesty bestowed a mace on the Society, and in 1664 he signed himself, in the Charter-book, its founder; at the same time the duke of York (afterwards James II.) signed himself a fellow.

The Royal Society of London may now be said to have been completely formed, and it must be considered as the oldest of its kind in Europe, if we except the Academy of the Lyncei at Rome. The Académie Française, which, in 1635, had been established by Richelieu, had for its object only the improvement of the French language; and though, in 1657, a number of learned men, among whom were Descartes, Gassendi, and Roberval, were accustomed to assemble at the apartments of Père Mersenne in Paris, for the purpose of making philosophical experiments, and of reading the solutions of such mathematical problems as, according to the general practice of that age, had been proposed to them, yet it was not till 1666 that Louis XIV., at the suggestion of M. Colbert, founded what was then called the Royal Academy of Sciences for purposes similar to those which engaged the attention of the Royal Society. To the latter therefore belongs the honour of having preceded the former in time, and probably that of having in some measure led to its formation. It must also be considered as having been the parent of the numerous scientific institutions which have since been formed in the British Isles as well as on the Continent.

It is observed by Hume, that its patent was all that the Society obtained from the king, who, though a lover of the sciences, animated them by his example alone, not by his bounty; and the historian contrasts the conduct of the English king with that of his contemporary Louis XIV., who fell short of Charles in genius and knowledge, while he exceeded him in liberality. There may be truth in this, but it ought to be remembered that, in 1667, the Society received from the crown a free gift of what was then called Chelsea College, which it afterwards sold for its benefit.

From the time of the charter being granted, the business of the Society assumed more importance, and in 1664 Mr. Hooke was appointed curator, with a salary of 80*l.* per annum. The west gallery of Gresham College was appointed as a repository for the instruments which were under his charge, and for a museum of natural curiosities which had been given by Mr. Colwal, one of the members. Sir John Cutler also settled on Mr. Hooke 50*l.* per annum, in consideration of his delivering a course of lectures on the History of Nature and Art, under the regulation of the Society; and the latter, in the same year, formed itself into seven committees for the purpose of considering the different subjects of which it was cognizant. These were mechanics, astronomy and optics, anatomy, chemistry, agriculture, the history of trade, natural phenomena; and there was, besides, a committee to manage the correspondence. The Royal Society early received many tokens of approbation from foreign nations, as well as from the nobility and the learned in this country. It corresponded frequently with the scientific men in France, and it was invited by Prince Leopold, the brother of the grand-duke of Tuscany, to keep up a mutual communication with the philosophers of Florence. The Germans published in their books favourable testimonials of its labours, and foreigners of distinction often attended its weekly meetings.

The first portion, or number, of the 'Philosophical Transactions,' as the work which the Society published was designated, appeared on Monday, March 6, 1665. It contained sixteen quarto pages, with an introduction by the secretary of the Society, Mr. Oldenburg, who was considered as the editor; and it was intended that one such number should be published on the first Monday of every month. After the fifth number came out (June, 1665), the public meetings of the members were discontinued on account of the plague which then raged; but it appears from a letter written by Mr. Boyle, at Oxford, to Oldenburg, who remained in London, that several of the members were then in the former city, and that they met and made experiments at his lodgings. From these experiments and the communications made by some of the members, there were formed three more numbers of the 'Transactions;' these were published at Oxford; but the ninth and all the succeeding numbers came out in London. The title of the work was changed in 1679 to that of 'Philosophical Collections,' when Dr. Hooke became the editor; but the former title was restored in January, 1683, with No. 143, which was published by Dr. Plot, who was then the secretary.

The council met again in Gresham College, in February, 1666, but the public meetings of the Society did not take place till June in that year. In the same year the great fire, which laid nearly all London in ashes, having compelled the authorities of the city to take possession of the rooms hitherto occupied by the Society, the latter gratefully accepted the offer of apartments in Arundel House, and it met there for the first time in January, 1667. The munificent owner of the mansion, Mr. Henry Howard of Norfolk (afterwards earl marshal of England), at the same time presented the Society with the library which had been purchased by his grandfather, Thomas, earl of Arundel, and which had formerly belonged to Matthew Corvinus, king of Hungary. This valuable library, consisting of several thousand printed volumes and numerous manuscripts, thus became the property of the Society, which immediately took measures to put it under the care of its own officers, and it has b[illegible]
sequently greatly increased by donations and
Being probably anxious to trespass as little [illegible]
the hospitality of the noble family to whom [illegible]
longed, the Society proposed (November, 1667) to [illegible]
subscription among its members, money to [illegible]
for itself; and by May in the following year
subscribed. Mr. Howard at the same time gen[illegible]
mised to give the ground for the purpose. The
man also offered a design for the building, and
Christopher Wren and Mr. Hooke gave plans: [illegible]
not appear that the project was carried any furt[illegible]
tober, 1674, at the invitation of the Gresham [illegible]
Society returned to its former apartments in that
which had now the name of the Royal Exchange. [illegible]
gallery was cleared out for the Society as a repos[illegible]
the long gallery as a library for the reception
which had till then remained at Arundel House.

Soon after this time the prosperity of the Soci[illegible]
to have suffered some diminution. In 1667,
Sprat's 'History' was published, there were [illegible]
members; in 1673, it appears that the number [illegible]
146, and of these, 79 were persons who had lo[illegible]
to pay their subscriptions. This great n[illegible]
faulters gave much uneasiness to those who [illegible]
to the Society; and the latter, besides maki[illegible]
applications for the arrears, seriously c[illegible]
attempt to enforce payment by legal pro[illegible]
not appear that this last measure was [illegible] in
tice, and the council adopted a more [illegible]
promoting the welfare of the Society in [illegible]
selves with the duty of delivering lectures on [illegible]
subjects, and in providing a number of good ex[illegible]
The first lecture, in pursuance of this plan, appear[illegible]
been delivered in 1674, by Sir William Petty [illegible]
ordered to be printed. The president (Lord
also proposed, in 1668, that a silver medal, [illegible]
twenty shillings, should be given to any [illegible]
curator, who should make before the Society [illegible]
larly meritorious experiment.

Dame Lady Sadleir, the relict of Dr. Croone, [illegible]
earliest members, left by her will, in 1706, a sum [illegible]
for the purpose of founding a lecture *for the* [illegible]
natural knowledge, to be read before the Roy[illegible]
this did not however come into operation [illegible]
the first was delivered by Dr. Stuart. The [illegible]
on electro-chemistry was founded in 1774, and
delivered in 1775, by Mr. Peter Woulfe.

In the infancy of the Society a due attention to the
racters of the persons admitted as fellows does [illegible]
to have been always given; and, in consequ[illegible]
joined who neither paid the fees nor contribu[illegible]
formation at the meetings, and, at the same [illegible]
ber of those who were excused the payments [illegible]
bear too great a proportion to the whole. In order
remedy these evils, in 1682, the president, Sir Ch[illegible]
Wren, brought in the draught of a statute in [illegible]
provided that any person proposing a candidate [illegible]
sion should give his name to some member of the [illegible]
at the next or at some following meeting of the
was to be considered whether the proposed cand[illegible]
likely to be useful to the Society or not; if the
were satisfied on this head, the candidate was to be
proposed at the next meeting, and afterwards [illegible]
as usual. On his election he was to sign the statutes
and on or before being admitted, he was to pay t[illegible]
fees. In the same year it was agreed t[illegible]
foreigners should be exempted from the payments
be presumed that the persons who were excused [illegible]
ment of the admission-fees or the weekly sub[illegible]
were such as, from the pressure of their circumstances [illegible]
unable to incur the expense, or such as, from the [illegible]
which they rendered to the Society, might j[illegible]
exemption; but it must be regretted that, amo[illegible]
petitioned to be excused on the former ground, is
found the name of Newton. This great man, who
elected in January, 1672, though he was not a[illegible]
February 1675 (probably on account of his residence
at Cambridge), cannot certainly be considered as one w[illegible]
income did not enable him to make an annual payment
fifty-two shillings.

It was proposed, in October, 1674, to refuse to
the permission, which had been before granted, to [illegible]

nt at the meetings of the Society, from an opinion that embers might be unwilling to bring forward their com- nications in the presence of such persons. And at the time it was proposed that the members should bind emselves not to divulge what passed in their meetings, it eing thought prejudicial to the interests of the Society that e particulars of the experiments and communications ould be made known before they appeared in the printed Transactions.' We read that, on one occasion only, a lady as permitted to be present at the meetings of the Society; is was in 1667, when the duchess of Newcastle, having pressed a wish to that effect, it was agreed to invite her ace, and some experiments, which had been prepared for e purpose, were repeated in her presence.

In 1667 Dr. Sprat (afterwards bishop of Rochester) pub- hed the first edition of his 'History of the Royal Society;' d in that work, while the object of the Society is dis- ctly declared to be the promotion of philosophy by expe- ment and by the observation of natural phenomena, an fort is made to remove the misapprehensions respecting e tendency of its proceedings, which appear to have been nerally entertained. It was objected that the mem- rs of the Society neglected the wiser and more discerning tients, and sought the guidance of their own unassisted dgments; and that, by admitting among them men of all untries and all religions, they endangered the stability of e established church. It was urged moreover that a phi- sophy founded on experiment was likely to lead to an erthrow of the Christian religion, and even to a denial of e existence of a Deity. Among these bigots were Henry ubbe, a physician, at Warwick, and the Rev. Robert osse, of Somersetshire; both these persons wrote mphlets, in which they attacked the Society with great rulence and scurrility of language, charging the members th bringing contempt on antient and solid learning, with dermining the universities, destroying Protestantism, and troducing popery in its stead. In his apology for the ciety, Dr. Sprat asserts that it in reality reverences the otsteps of the antients, and that it willingly subscribes to eir opinion in matters purely probable; but he claims r it the privilege of judging from facts, and he justifies is liberty by the practice of the Greeks, who, he observes, adily received the learning of the Egyptians, while they tirely rejected their superstitions. He further adds that e conversation of the learned men who first met at Oxford rved to form a race of young students whose minds be- me imbued with a taste for natural knowledge; and that, their influence, the discipline of the university was pre- rved from the spiritual frenzy which then prevailed in the ngdom. The Society also found an able apologist in Mr. lanville, who, in 1668, published a pamphlet, entitled Plus Ultra, or the Progress of Knowledge since the days Aristotle.'

By the death of Dr. Wilkins (then bishop of Chester), e of the earliest members, the Society obtained a legacy 400*l.*, which, in January, 1675, was laid out in the pur- ase of an annual income of 24*l.*, from certain fee farm nts at Lewes in Sussex; and in January, 1682, the llege and lands in Chelsea, which had been granted to e Society, were sold to the king for 1300*l.*; this sum was on afterwards vested in African and East Indian stock; d from that time the Society began to possess a permanent venue. Till the year 1668 no fixed salary was allowed to e secretary, but Mr. Oldenburg, who had long held that ost, received 50*l.* occasionally; and in that year it was greed to allow him 40*l.* per annum. After his death 1677) two secretaries were appointed, with salaries; but n 1685, Mr. Aston and Mr. Robinson declining on a sudden o serve the Society, the council resolved, in order to avoid he inconvenience of being so deserted in future, to have wo honorary secretaries; it was agreed also to have a secre- ary with a fixed salary to transact the business, and the ualifications required in the person who should fill the atter post are stated at length in Birch's 'History,' vol. iv. Of the former, Sir John Hoskyns and Dr. Gale were the two first; and in January, 1686, Mr. Edmund Halley was ppointed the paid secretary, at 50*l.* per annum.

In 1701 the Society, which till this time had continued to hold its meetings in Gresham College, removed to a spacious house which it purchased in Crane Court, Fleet Street. It had long been felt that the college was too remote from the dwellings of many of the members; and, as early as 1666, it had been proposed to obtain a house in Westminster. The house in Crane Court afforded room for the meetings, for the library, and for the museum of curiosities; and here the reading of papers and the exhibition of experiments took place, as before, till the year 1782, when the government assigned to the Society the apartments which it now occupies in Somerset House. On removing to the latter place, it became necessary to dispose of the museum for want of room; but this inconvenience has since been obviated, as in 1826 the rooms formerly used by the commissioners of the lottery were given up to the Society. The library is now very extensive, and a catalogue of the scientific books, lately made at a great expense, forms a thick octavo volume.

In 1703 Sir Isaac Newton was appointed president of the Society, and this honourable post was held by the greatest of philosophers till his death, which happened in 1727. The experiments of Newton on telescopes and on light and colours were amongst the first subjects which gave a value to the 'Transactions' of the Society; and the latter showed its sense of the honour which it derived from being able to number him among its fellows, by publishing, at its own expense, in 1686, the first edition of the 'Principia;' though its pecuniary circumstances could not then have been flourishing, since at the end of the following year it had incurred debts, for the payment of which it was obliged to sell part of its East India stock.

The service rendered to the cause of science from the beginning of the eighteenth century has earned for the Society the respect and gratitude of every man to whom the advancement of the human intellect is an object of high consideration. The Society numbers among those who are and who have been its members, some of the brightest ornaments of philosophy and human nature; and it may be said that most of the discoveries by which the face of science has been changed have been made known to the world through the papers published in the volumes of its 'Transactions.' In proof of this we may refer to Dr. Thomson's 'History of the Royal Society,' in which the subjects of the papers are reduced under the heads of natural history, mathematics, mechanical philosophy, and chemistry, besides some miscellaneous matters; also to the volumes of the 'Transactions' which have been published since 1800, when the above-mentioned 'History' terminates, and which contain, among others of great value, the papers of Sir Humphry Davy, with those of Faraday, Young, Kater, and Wollaston.

It has been said above that the 'Philosophical Transactions' were at first published in monthly numbers: these were afterwards collected into volumes, and, from the commencement in 1665 to the year 1800, the work consisted of 90 volumes. From that time a volume has come out annually, and, up to the present year (1841), 131 volumes have been published. It appears that, till the 47th volume was published, the printing of the Transactions was entirely the act of the several secretaries, the Society never interesting itself further in that matter than by occasionally recommending the revival of the publication, when from any circumstance it appeared to be suspended. But in 1752 a committee was appointed to consider the papers which were read before the Society, and to select such as should be judged most proper to appear in the future Transactions; and this practice has ever since been followed. The Society however constantly declares that it never, as a body, gives its opinion on any subject, whether of nature or art, which comes before it; the facts and reasonings stated in their papers resting entirely on the credit and judgment of their respective authors.

Honorary recompenses have been liberally bestowed by the Society on persons distinguished by their discoveries in pure science or in philosophy. The first occasion on which the Society became possessed of the means of so rewarding merit arose from a bequest of Sir Godfrey Copley, one of its members; this gentleman, at his death in 1709, left 100*l.*, the interest of which, or five pounds, was to be given annually to the person who, in the course of the preceding year, had written the best paper on any subject relating to experimental philosophy. The donation has since been put in the more liberal form of a gold medal, and it is awarded indifferently either to foreigners or Englishmen, for the sake of encouraging an honourable competition among the philosophers of all countries.

In 1796 Sir Benjamin Thomson (Count Rumford) presented to the Society 1000*l.* in the 3 per cent. stock, for the purpose of forming, with the interest for two years (60*l.*), a biennial prize to be given for the most important discovery or the most useful improvement made during the two preceding years on heat or on light. The prize is given in the form of a gold and a silver medal, both of which are struck in the same die. During several of the biennial periods no opportunity occurred of awarding the prize, and at these times the interest was added to the principal sum. The interest of this additional sum is always given with the two medals: and the first who received the prize was Count Rumford himself, in 1800; and the second was Professor Leslie (1804). In 1825 his majesty George IV., for the purpose of further promoting the objects and progress of science, made to the Society an annual grant of 100 guineas in order to establish two prize medals, which are to be presented to the persons who during the year shall make the most important discovery in science or art; and in 1826 the medals were awarded to Mr. John Dalton and Mr. James Ivory.

On delivering to a gentleman the medal which had been awarded to him for his discoveries in science, Sir John Pringle, who held the office of president from 1772 to 1778, made it a rule to deliver a speech, in which, after touching on the history of that branch of philosophy to which the discovery or communication referred, he stated the particular points in which the individual had distinguished himself. The first of these speeches was made on presenting to Dr. Priestley the gold medal for his paper entitled 'Observations on the different kinds of Air,' which had been read before the Society, in March, 1772. Five other speeches were delivered by the same president on similar occasions; and all the six are considered elegant compositions, as well as learned and critical dissertations. This liberal practice, by which the value of the testimonial to the receiver is so much enhanced, is still continued; and it is also become customary, at every anniversary meeting, to notice, in an appropriate speech, the principal circumstances in the life of any distinguished member who may have died during the year. When the council, in 1826, had awarded the royal medals to Mr. Dalton of Manchester and to Mr. Ivory, the President, Sir Humphry Davy, took occasion to state that the first was for the development of the chemical theory of definite proportions, commonly called the *atomic theory*, and for various other labours in chemical and physical science. He further observed that Dalton's discovery had laid the foundation for future researches respecting the sublime and transcendental part of corpuscular action; and he compared the merits of the discoverer, in this respect, to those of Kepler in astronomy. The president also stated that the second medal was awarded to Mr. Ivory for his papers on the laws regulating the forms of planets, on astronomical refractions, and for other mathematical illustrations of important points in astronomy; and he paid at the same time some high compliments to Mr. Ivory for his disinterested pursuit of objects of science which have no immediate popularity. One of the Copley medals had been on the preceding year awarded to M. Arago and another to Mr. Barlow, for their discoveries in magnetism. On the same occasion the president mentioned with particular notice, among the foreign members deceased, Scarpa, the celebrated anatomist of Pavia, and Piazzi, the astronomer, who discovered the planet Ceres; and, among the home members, Mr. Taylor Combe and Sir Stamford Raffles.

The nobleman who now occupies the chair of the Royal Society, following the example of his illustrious predecessors, delivered at the last anniversary meeting (November 30, 1840) an eloquent address which has been printed at the request of the Fellows. On this occasion the royal medals were presented to Sir John F. W. Herschel for his discoveries in optics and chemistry, and to Professor Wheatstone for his solution of the phenomena of double vision. One of the Copley medals was presented to Professor Liebig for his researches in chemistry, and another to M. Sturm for his mathematical labours; and lastly the Rumford medal was presented to M. Biot for his researches on light.

It is perhaps impossible that, in a large body of men engaged in similar pursuits, differences should not arise; and the Royal Society has not been entirely free from the evils attending disagreements among its members. In 1778 a dispute about the comparative advantages of blunt and pointed conductors for protecting buildings from the effects of lightning arose to such a height that the president, Sir John Pringle, felt himself compelled to resign. [PRINGLE, JOHN.] At a later period Sir Joseph Banks was accused of partiality in the disposal of the medals and even in the election of members; and, under the impression that his government was arbitrary, scientific men were deterred from making communications to the Society. Even the awards of the medals to Dalton and Ivory by Sir Humphry Davy were made subjects of animadversion, on the ground that the discoveries of the former had been indicated by another person, and that the researches of the latter were not immediately useful to man. In the first instance mentioned above, the president may have erred in putting himself at the head of a party in the Society; but it is probable that most of the grievances subsequently complained of originated only in the disappointed expectations of ambitious individuals. If at any time however the complaints have not been without foundation, the elevated character of the papers which within the last twenty years have been published in the 'Transactions,' shows that the interests of science have been generously placed above every private consideration.

According to the present statutes of the Society, [illegible] candidate for admission must be recommended by a [illegible] ficate in writing signed by six or more Fellows, [illegible] three at least must certify that the recommendation [illegible] personal knowledge; and the name, qualifications, [illegible] the candidate must remain in the meeting-room [illegible] Society during five ordinary meetings before he can be [illegible] to the vote. The votes are taken by ballot, and the [illegible] cannot be elected unless two-thirds of the num [illegible] vote in his favour. The person elected must appear [illegible] sion on or before the fourth ordinary meeting of the [illegible] after his election; and previously to such ap [illegible] must pay the sum of 10*l*. for admission money [illegible] also pay 4*l*. per annum as long as he continues a fel [illegible] the Society; but the annual payments may be c [illegible] for by paying at once the sum of 60*l*. Fellows are en [illegible] gratis to a copy of the 'Philosophical Transactions,' c [illegible] mencing with that volume which is published next [illegible] their admission. Any Fellow disobeying the statutes [illegible] orders of the Society or council, or defaming the [illegible] by speaking, writing, or printing, or doing anyt [illegible] trimental or dishonourable to the Society, will be [illegible] from it.

A prince of the blood, a peer of the United [illegible] dom, a member of the Privy Council, any foreign sover [illegible] or the son of such prince, may be proposed a [illegible] ordinary meetings of the Society, and voted for on [illegible] day; notice having been given of such proposal [illegible] ceding meeting of the Society. Foreign [illegible] exempted from the obligations which ordinary fellows [illegible] enjoined to perform; but their number is not to excee [illegible]

The council and officers for the ensuing year are [illegible] on the 30th November; the latter consist of the presid [illegible] treasurer, principal secretaries, and foreign s [illegible] etary. [illegible] new council consists of eleven members of the [illegible] cil and of ten fellows who are not so. These a [illegible] previously to the anniversary meeting.

The president presides at the meetings, and regulates the debates of the Society, the council, and the committees: he states questions, calls for reports and accounts, checks [illegible] gularities, and observes that the statutes of the Soc [illegible] executed. The treasurer receives all money due [illegible] Society and disburses all sums payable by it; he also [illegible] accounts of the receipts and payments. He has [illegible] the title-deeds of the Society's estates, the polic [illegible] ance, &c. The secretaries attend all meeti [illegible] of the [illegible] ciety, the council, and the committees of pa [illegible]; [illegible] occasions, when the president has taken the ch [illegible] senior secretary reads the minutes of the precedi [illegible] ing, and afterwards takes minutes of the busi [illegible] orders of the present meeting; these are to be entered by the assistant-secretary in the books to which they relate. They have also charge (under the directions of the committee of papers) of printing the 'Philosophical Transactions.' The assistant-secretary is not a fellow of the Society [illegible] is paid for his services. He enters all minutes in [illegible] journal-books, and makes an index to each; he has the [illegible] tody of the charter-book, statute-book, &c., and of [illegible] papers and writings belonging to the Society. The lib [illegible] attends at the library every Monday and Thursday, from [illegible] A.M. to 4 P.M., for the accommodation of such fellows as [illegible] to read the books and MSS.

The ordinary meetings of the Society are held once a week, from November till the end of Trinity term, at [illegible] past 8 P.M., in the apartments at Somerset House.

ɜ introduction to Dr. Thomson's 'History of the
ociety,' there is given a list of all the presidents,
rd Brouncker, who was appointed in 1663, to Sir
ɜanks, who was elected in 1778, and who held the
l his death (1820). The succeeding presidents

umphry Davy, elected in 1820,
'avies Gilbert, . . „ 1827,
H. the Duke of Sussex, . „ 1830,
[arquis of Northampton (who continues) 1838.

fices of principal Secretaries have been successively
nce 1807, by Sir H. Davy, Dr. Wollaston, Mr.
Mr. Brande, Sir John Herschel, Mr. Children, Major
Dr. Roget, and Mr. Christie: the two last named of
e the present Secretaries. Mr. Daniell is the pre-
eign Secretary.

g many years the Royal Society may be said to have
depository of nearly all the science of the country;
science became at length too extensive to be ade-
ultivated by one body of men, and then separate
ependent societies formed themselves, each having
he promotion of one particular branch of the phi-
of nature or one branch of the arts. The labours
accomplished by these associations are such, that
l Society may be justly proud of them as the works
ildren; and the high place which she continues
n the promotion of the sciences generally, cannot
spire the societies themselves with reverence for
from whence they diverged.

nportant part which the Royal Society has per-
n advancing the objects of the British Association
resent expedition to the antarctic regions of the
scientific objects, deserves to be particularly men-
this place. The lords commissioners of the Ad-
aving requested the president and council of the
o communicate for their information any suggestions
g the subjects to which they might wish the attention
n James Ross to be directed, the council formed
o five distinct committees, consisting of members
rly conversant with the several branches of science
ended in the observations and experiments pro-
be made during the voyage. The result of their
a series of reports on the several objects of scien-
y in physics, meteorology, geology and minera-
any and zoology: and the report on physics and
ogy, which has been printed, contains a course of
on relating to the use of the instruments to be em-
nd to the manner of making the necessary obser-
or terrestrial magnetism, the figure of the earth,
, meteorology, the distribution of temperature in
nd on land, currents, the depth of the sea, variable
raction, and eclipses. It may be objected that the
f all the subjects of inquiry are too numerous to be
shed in the time allowed for the voyage, but it
be observed that the instructions profess to have
wn up not only as a guide for the persons em-
the present expedition, but also to enable scientific
in general to co-operate in promoting the same

Royal Society of Göttingen was established by
. in 1751, and it has published several volumes of
ions.

oyal Society of Edinburgh was incorporated by a
n 1783; though, under the name of the Philoso-
ociety of Edinburgh, the association had existed
9, in which year it was formed by the influence of
laurin and other learned men in the metropolis of
. In 1811 the Society obtained a new charter, by
was impowered to form a library and a museum.
e of its 'Transactions' comes out as often as the
of papers which are thought worthy of being printed
ient to make one; and up to the present year
urteen volumes have been published. A medal of
of 60*l.*, arising from a part of the interest on 1000*l.*
d been left by Mr. Alexander Keith, in 1819, for
g the sciences and arts of Scotland, is awarded as
l prize for the most important scientific discoveries
ay be communicated to the Society and published in
sactions.' This Keith medal was adjudged, for the
, to Dr. (Sir David) Brewster in 1828.

ALTY. The French words *roi* and *royal* corre-
the Latin words *rex* and *regalis*; and from *royal* has
med *royalté* (now *royauté*); whence has been borrowed the English word *royalty*. The corresponding Latin word is *regalitas*, which occurs in the Latin of the middle ages. (Ducange, *in v.*)

Royalty properly denotes the condition or *status* of a person of royal rank, such as a king or queen, or reigning prince or duke, or any of their kindred. [King.] The possession of the royal *status* or condition does not indicate that the possessor of it is invested with any determinate political powers; and therefore *royalty* is not equivalent to *monarchy* or *sovereignty*. A royal person is not necessarily a monarch; or, in other words, does not necessarily possess the entire sovereign power. The powers possessed by persons of royal dignity have been very different in different times and places; and have varied from the performance of some merely honorary functions to the exercise of the entire sovereignty. The *kings* (ἄνακτες, βασιλῆες) of the Homeric age were properly a governing class of nobles. (See Müller, *Hist. of Liter. of Greece*, ch. 4, § 1.) Thus Telemachus says that there are many kings in Ithaca, both old and young, besides himself (*Od.*, i. 394); and Alcinous says that he rules over the Phæacians, with twelve other kings (*Od.*, viii. 390). As popular institutions were developed in Greece, the office of king became, in several states, merely honorary, and was particularly connected with the performance of certain antient religious rites. Thus, at Athens, the king-archon (ἄρχων βασιλεὺς) was an annual officer, who had the superintendence of religious affairs; his wife was called, during the year of office, *βασίλισσα*, or *queen*. (Compare Hermann, *Gr. Ant.*, § 56.) Rome likewise retained, after the expulsion of its kings, a high sacerdotal officer, named the *king of the sacrifices* (rex sacrificulus), who performed the sacred rites which had formerly been performed by the kings. In like manner the Teutonic kings were only the chiefs of the military and sacerdotal aristocracy of the tribe, and did not possess the entire sovereign power ('nec regibus infinita ac libera potestas,' says Tacitus, *Germ.*, 7. See Grimm, *Deutsche Rechtsalterthümer*, p. 229-65). In more modern times, the kings of England, France (since 1815), Holland, Belgium, Bavaria, Saxony, Wirtemburg, Spain, and Portugal (since the late revolutions) have possessed only a share of the sovereign power.

On the other hand many kings have possessed the entire sovereign power, and have therefore been monarchs properly so called. Such were the kings of antient Persia, and the kings of France and Spain in the seventeenth and eighteenth centuries, and such are the kings of Prussia.

From the preceding observations it results that the name of king or the possession of the royal *status* does not determine the political powers of the person indicated (as would be the case if he were called monarch or sovereign); but that *king* is a title of honour which may be borne by persons having very different amounts and sorts of political power. 'Titles of office,' says Mr. Bentham, 'are aggregates of dissimilar parts, which cannot be compared until we know the nature of their constituent elements. If these elements were determined, they would form the basis of a universal political language. But as it is, how can the powers of the officers of a government be described except with reference to the actual institutions of some given state? What relation is there between the First Consul of France and the consuls of Rome, or the consuls of trade? between the king of England, the king of Sweden, and the king of Prussia? between the emperor of Germany and the emperor of Russia? between the antient *duc et pair* of France, the English duke, the grand-duke of Russia, the grand-duke of Tuscany? between the mayor of Bordeaux and the mayor of London? A volume would not suffice to state all these discrepancies.' (*Traités de Législation*, tom. i., p. 309.)

In popular discourse *royalty* is made equivalent to *monarchy* or *sovereignty*; and a king is called monarch or sovereign without any reference to the fact whether he possesses the entire sovereign power or only a portion of it. The principal causes of this confusion are stated in Monarchy. The confusion is attended with important consequences both in speculative and practical politics.

It may be added, that the attribute of royalty is sometimes transferred metaphorically to certain animals or species of animals, in order to denote pre-eminence. Thus the principal bee in the hive is called the *queen-bee* [Bee, vol. iv., p. 151] (called the *king-bee* by the Romans: Virg., *Georg.*, iv., 68, 75, 95, 106, 212); the lion is known (particularly in fables) as the king of animals; and a species of tiger is styled the *royal tiger*. [Tiger.] Compare Sovereignty.

ROYDSIA, an Indian genus of plants allied to the natural family of Capparideæ, named by Dr. Roxburgh in compliment to Sir J. Royds, one of the judges of the supreme court of Bengal, whom he describes as an eminent benefactor to the science of botany. The genus consists of a single species indigenous in the forests of Silhet, where, with a stout stem and numerous branches, it climbs over the trees to a great extent, and flowers in the month of March, diffusing a strong but pleasant odour from its numerous blossoms, arranged in axillary racemes or terminal panicles. The leaves are alternate, oblong, coriaceous, smooth on both sides, and without stipules. The calyx is six-partite and of a pale yellow colour. Corol none. Stamens numerous, with the filaments inserted on the apex of a short column. Ovary pedicelled, three celled, with two rows of ovules in each, attached to the axis. Drupe berried, of the size of a large olive, orange-coloured. Pulp abundant and yellow. Nut oblong, single-celled and three-valved. Seed solitary, conformable to the nut. The plant is figured in Roxburgh's 'Coromandel Plants,' p. 289, and is well suited to the hothouses of this country.

ROYE. [SOMME.]

RO'YLEA, a Himalayan genus of plants, of the natural family of Labiatæ and tribe Balloteæ, named by Dr. Wallich in compliment to Dr. Royle, author of the 'Illustrations of the Botany of the Himalayan Mountains and of Cashmere,' who first found it on the Sirmore Mountains. The plant forms a handsome shrub, with many branches and an abundance of pale green glaucous leaves. It is characterised by having the calyx ovate, tubular, 10-nerved, and semi-quinquefid; corol shorter than the calyx, two-lipped, lips unequal; stamens 4, didynamous, ascending under the upper lip; anthers bilocular; style bifid.

R. elegans, the only species known, is called *putkuroo* by the natives of the mountains, where it is indigenous, and is employed by them as a febrifuge. It is suited to the shrubberies of this country.

ROYSTON. [HERTFORDSHIRE.]

ROYSTON CROW, the common English name for the *Hooded Crow*, *Corvus Cornix*, Linn.

Description.—Male.—Head and the whole body fine grey-ash colour; throat, wings, and rounded tail black with browned reflections; bill and feet black; iris brown. Length about 22 inches.

Female.—Less than the male; the black on the throat not so extensive in front as it is in him; reflections of the wings and tail less vivid; and the grey of the body more clouded with rusty hue.

The *young* assume the colour of their parents at an early period.

This is the *Mulacchia*, *Munacchia*, *Cornacchia*, and *Corvo palumbino* of the Italians; *Corneille sauvage* and *Corneille mantelée* of the French; *Kraka* of the Swedes; *Grau-krähe* and *Nebel-krähe* of the Germans; and *Brunyr Jwerddon* of the antient British.

Habits, Food, &c.—The sea-shore and the banks of tidal rivers are the favourite haunts of this species, though they are frequently found far inland, and animal substances are preferred by them as food. Sand-worms, shell-fish, crustaceans, and other animal matters left by the retiring tide seem to be most welcome to them. They appear to be both knowing and affectionate. Mr. Selby repeatedly observed one of these birds to soar up to a considerable height in the air with a cockle or muscle in its bill, and then drop it upon the rock in order to obtain the included fish. Pennant tells a painful story of its affection. 'One,' says he, 'which had been shot and hung by its legs on a tree adjacent to the nest, was discovered by its companion on returning from forage. It perched over the dead body and surveyed it attentively, as if in expectation of its revival; at length, on a windy day, the corpse being put in motion, the survivor, deceived by it, descended, fluttering round for a considerable time, endeavouring to release its mate and uttering a melancholy scream; at last, finding its efforts to be in vain, it retired without ever returning to its usual haunts.' The same author however gives the species a very bad character for mischief, worse even than that of the *Carrion Crow*, and says that they pick out the eyes of lambs, and even of horses when bogged; whence they are proscribed in many places, and a price set upon their heads. He adds that for want of other food they will eat cranberries and other mountain-berries.

The nest is generally built in trees; but in their absence, among rocks and deep chasms in hill sides. Mr. S who found it in the last-mentioned localities in Orkn scribes the outside of the nest as composed of wr heather and large roots or stalks, and the lining as be wool and hair: the three young in one nest which he into, were of the same colours as the parents. The four or five in number, are greenish mottled with brown.

The Hooded Crow is said to be more docile in learn speak than the Carrion Crow. In the *Portraits d'O* the following quatrain appears under a very fair cut species:—

> 'Ceste Corneille est dite emmantelée,
> Qui seulement en hyver se peut voir.
> Sa couleur est cendrée avec le noir,
> Comme un manteau; dont elle est appellée.

Geographical Distribution.—Extensive. In Europ widely spread. Denmark, Sweden, Norway, Germany land, our own islands, Italy (where it is permanent a ing to the Prince of Canino), and France possess it. found at Iceland, in Russia, and Siberia, but not beyo Lena. It is common in Smyrna, according to Mr. S land. The Grecian Archipelago generally possesses it. occurs in the countries between the Black and the C seas. Latham states that it is very common in some of India. Sonnerat saw it in the Philippine Islands. minck states that it swarms in Carinthia and Croati that it is very common in Japan.

In the southern parts of this island the Hooded Cr winter visitor, arriving about the time of the appeara the Woodcocks, and departing northward in April. are instances on record of these birds breeding as fa as King's Lynn in Norfolk. In the north and west o land, the Hebrides, and the Orkney and Shetland the species is permanent throughout the year. The visitors are supposed to come from Sweden, Norwa other countries to the north-east. In the north of this crow is indigenous. In the Faroe Islands it bre considerable numbers.

Corvus Cornix.

Varieties.—Sometimes entirely white; at others black or blackish.

HYBRIDS.

There are several instances on record of a fertile between the Carrion Crow (*Corvus Corone*) and the Crow.

Mr. Williamson says, 'The Hooded Crow has been to breed near Scarborough on two or three occasio one instance a female Hooded Crow was observed with a Carrion Crow on a large tree at Hackness, they succeeded in rearing their young. The Carrio was shot by the gamekeeper, but the following ye Hooded Crow returned with a new mate of the same hue as the former one to her old nest. The Carri young Crows were again all shot: the old female vigilance escaped all the efforts of the keepers to dest time returned with a fresh mate; she was not in successful, but was shot, and is now pre- e Scarborough Museum. The young birds resembling the Hooded and others the Carrion eir plumage.' (*Zool. Proc.*, 1836.) Mr. Selby ed such a union at Fowberry. (*Address to the Ber- Naturalists' Club*, 1834.) The same ornitholo- tions that Sir W. Jardine observed a similar pairing friesshire. Temminck also observes that a mixed etween the Hooded Crow and Carrion Crow some- curs in the northern countries, where the latter is

four successive years,' says a correspondent in the *aturalist*, 'I had opportunities of witnessing the of the Carrion Crow and the Hooded Crow in some ech-trees which surround my house in Forfarshire. ver occupied the old nest, nor did they always build on the same tree; nor was I positively certain that same individuals who returned every year to these ugh it is probable they were, for they were never l. Knowing the predatory propensities of the Car- w on hen's eggs, young ducks, and even Turkey I would have shot them had they been a pair of Crows; but I was anxious to mark the result of peared to me at the time to be a remarkable union. from the manners of the two birds, the almost con- tion, and carefulness exhibited, I should say ooded Crow was the female, though the Carrion d frequently sit upon the eggs. After the young of t year took wing, I perceived that the one was a and the other a Hooded Crow; and this distinctive r was maintained in the young which were hatched ar as long as I remained in the country. I shot the pair, and ascertained that the Hooded one was , and the Carrion was the male, which confirmed conjectures of the sexes of the parents. Ever and old were unmolested by me; but notwith- increase of number every year after the first one pair came annually to build on these beech- Atkinson's *Compendium of the Ornithology of* . the pairing of a male Hooded Crow with a Crow at Aroquhar on Loch Long is re- t, which was like that of a Carrion Crow, t k of a tall pine, and the union lasted for fou s.

EFAC NTS are external agents which cause of the part to which they are applied. If long d, they may, according to their nature, produce on and some of its consequences. In such cir they are termed BLISTERS, or ESCHAROTICS. ver a degree of action short of what entitles them appellations which is now contemplated. Thus with the hand or warm cloths often relieves spas- : pains; and a hot poultice or warm inflammation of superficial or even . Embrocations, when of a stimulating cients; and blisters kept in contact with short time only, cause redness of the part, secondary effects of a very beneficial kind. ses of fever in the sinking stage may be recovered cession of flying blisters, as these temporary appli- re termed, placed on different parts of the body, ly over parts where the skin is thin. Their action xpedited by previously rubbing the part with proof oil of turpentine, or by using a portion of linen in the acetum cantharidis instead of the common By diligent employment of such means many lives may be saved. (See Dr. Graves, in John- ledico-Chirurg. Review,' for Oct. 1835, p. 529.) ients are also very usefully applied to the spine nervous diseases.

ELLITE. [TOURMALINE.]

ENS, PETER PAUL, the most celebrated painter lemish school, was born at Cologne, on the 29th of 77. His father, John Rubens, who was one of the of Antwerp, had taken refuge at Cologne with his consequence of the disturbances prevailing in the s. In that city he died, in the year 1587. His tly afterwards took advantage of the restoration to the Roman Catholic faith by the victories of Parma, and returned to Antwerp. In his 16th Paul Rubens was placed as a page in the house- Countess of Lalaing, but the life did not suit him, and he soon returned home. At his own desire he became the pupil, first of Tobias Verhaegt, a landscape painter, and then of Adrian van Oort, who was celebrated as a colourist. His next master was Otho van Veen, or, as he is commonly called, Otho Venius, court painter to the Infanta Isabella and the Archduke Albert. In the year 1600, when Rubens was 23 years old, he was advised by his master to visit Italy. He was already thoroughly conversant with all the technical and general knowledge which would enable him to reap the full benefit from such a journey, and he had executed some considerable pictures. He proceeded first to Venice, and thence to Mantua, where his letters of recommendation from the Archduke Albert secured him the favour of the Duke Vincenzio Gonzaga. At his court Rubens accepted the place of gentleman of the chamber, and availed himself of the opportunity thus afforded him of studying the frescoes of Giulio Romano and the other works of art then belonging to the family of Gonzaga. In 1601 he went to Rome for a short time, and after returning to Mantua, visited Venice, and devoted himself to the study of the pictures of Titian and Paul Veronese. The works of these two masters probably exercised the strongest influence in the full development of his natural genius for colour. The Archduke Albert commissioned Rubens to paint three pictures for the church of Santa Croce in Gerusalemme, at Rome, and he returned thither for that purpose, and with the object of copying some celebrated pictures for the Duke of Mantua, and he probably visited Florence in his way back. In 1605 the Duke Vincenzio Gonzaga sent him on a special mission to Spain with a present for Philip III. That king received him most graciously, and after painting a large number of portraits of persons connected with the court of Madrid, he returned to Mantua. He paid a third visit to Rome, where he was joined by his elder brother Philip, and in 1607 went through Milan to Genoa. In the latter city he executed many works, and a great number of his pictures still remain there. In 1608 he received news of his mother's illness, and returned immediately to Antwerp, where however he arrived too late to find her alive.

The wishes of Albert and Isabella induced Rubens to abandon his project of returning to Italy; and in 1609 he married his first wife, Elizabeth Brant, and settled at Antwerp. The beautiful picture in the Munich gallery, representing himself and his wife seated in a garden, was probably painted shortly after his marriage. The outline is more precise and the style more true and homely than in most of his works. The best account of its characteristic merits is to be found in a note of Mrs. Jameson's to Dr. Waagen's 'Life of Rubens' (Translation, p. 21). In the year 1620 Rubens was commissioned to paint the series of pictures now in the Louvre which represent the principal events in the life of Maria de' Medici. He went to Paris, and received his instructions for these works, but the pictures themselves were executed at Antwerp, for the most part by the hands of his numerous pupils. In fact, as they were placed in the Luxembourg in 1625, it was physically impossible that he should have painted them himself. The original sketches, now in the Munich gallery, are very far superior to the finished pictures. During his last residence at Paris, Rubens became acquainted with the Duke of Buckingham, who purchased his collection of statues and other works of art for 60,000 florins, or according to De Piles, for 100,000. In 1626 Rubens lost his wife, and he shortly afterwards made a journey, in which he visited the principal Dutch painters of that time.

Rubens had been highly esteemed by the Archduke Albert, and after the death of that prince he continued in the favour of his widow the Infanta. On her return from the siege of Breda, in company with Spinola, in 1625, she visited Rubens's house; and in 1627, when Charles I. declared war against France, Rubens was entrusted with some negociations with Gerbier, Charles's agent at the Hague. In the autumn of the same year he was dispatched to Madrid. During his stay in Spain he executed several very fine pictures, and gained the favour of Philip IV. and the Count-Duke of Olivarez. In 1629 Rubens was sent by the Infanta as ambassador to England. The painter succeeded as a diplomatist, and his merits in procuring Charles's acquiescence in the peace were recognised by the court of Spain. Whilst in England, he stood high in the favour of Charles I., whose feeling for the fine arts seems to have been of the strongest kind. The allegory of War and Peace, now in the National Gallery, was painted as a suitable present to the king, on the occasion of these negociations. After the breaking up of Charles's matchless collection, this picture was transferred to Genoa, but was purchased during the French revolution from the Doria family, and thus restored to this country. The ceiling of Whitehall was sketched during Rubens's stay in England, but painted at Antwerp at a later period. For the latter work he is said to have received 3000*l*. In 1631 Rubens married his second wife, Helena Forman, a beautiful girl of sixteen. Her portrait often recurs in his pictures. He was again employed on a mission to Holland in 1633; and in December of that year, his patroness, the Infanta Isabella, died.

Rubens's fame now stood very high, and the commissions he received could only be executed by the aid of his numerous and able pupils. In 1635 he became subject to gout in the hands, which disabled him from painting with ease on a large scale. At the request of the authorities of Antwerp, he executed sketches for the decoration of the arches to be erected on the entry of the Cardinal Infant, Don Ferdinand, the new regent of the Low Countries. In 1540 the disease under which he had suffered caused his death. He expired in the 63rd year of his age, and was buried in the church of St. James at Antwerp.

Rubens's personal appearance was prepossessing, and his manner and conduct such as to make him generally beloved. Towards other artists he acted with the greatest generosity, and he is said to have relieved the poverty of Vandyck by purchasing all the pictures which that artist had in his studio.

His own character and merits as a painter have been the subject of much controversy, and will probably always furnish matter for discussion.

In all questions of literature and art, we are never satisfied without constantly comparing things which are in themselves utterly dissimilar. The source of pleasure from works of art is obscure, and the nature of the pleasure itself is little capable of definition, but men think to obtain greater precision, and to arrive at the reason why they are pleased, by this process of comparison. To a certain extent perhaps we may succeed, but in general such comparisons have a tendency to narrow our field of enjoyment, and to lead us to dogmatise on what cannot be reduced to fixed rules. A man may derive greater satisfaction from the works of Perugino or Francesco Francia than from those of Rubens or Teniers; he may feel the beauty of the Parthenon more than that of Strasburg cathedral; but he is not therefore justified in saying that Rubens was a bad painter, or that Erwin of Steinbach was an indifferent architect.

The principal sources of pleasure in painting appear to be form, composition, colour, and, the highest of all, the expression of human character and action. The subdivisions of this last branch are of course infinite, and comprise the higher and holier feelings, as well as those which are more properly a portion of our animal nature. In those parts of his art which act immediately on the senses, Rubens was without doubt a great master. He understood the perfect management of light and shade, of composition, and of colour. If his merits are disputed, it is with reference to the subjects which he painted and to his mode of treating them, not to his technical skill. Before his visit to Italy he had acquired an individual character as an artist. The fruit of his labours there was not a crude mass of detached imitations, but, whilst he carefully studied the great masters at Venice and elsewhere, his vigorous genius assimilated and appropriated to itself all that it took up or borrowed. The excess of individual peculiarity in Rubens certainly amounts to *manner* in the narrower sense of the word. That peculiarity of feeling too did not dwell on the forms which are best fitted for expressing the tranquil and devotional sentiments which prevail in early Christian art, but still, such as it was, it was eminently characteristic of a *great painter*. Sculpture exceeds painting in its power of expressing form, and equals it in that of portraying fixed character; but painting only can express the tumult and energy of human action in full power and motion. In this Rubens excelled, and it is surely no mean excellence. We are ready to grant that his Madonnas are, for the most part, clumsy and undignified; that their forms are unfitted for the being whom they represent; and that exaggeration sometimes disfigures scenes where quiet and holy feelings would be more in place. Notwithstanding all this, the stronger human passions and actions have an intense interest for mankind. The anima. energy and the sensual characteristics of man are a part of that complex whole which we call human nature, although they are not the most elevated part. If art is to represent man as he is, these elements cannot be wholly overlooked. The Greek drama displayed them too glaringly in the oldest comedy, and Greek sculpture embodied them in its fau and satyrs. An acute sense of beauty indeed gen softened the more disgusting features, and we might that Rubens had been oftener touched with similar scru We must take him however as he is: with all his techn excellence, and with all the incomparable energy and bea ness which animates his best works. In them there is none of that idle filling up of vacant corners, or that insertion of cold academic figures wholly unconcerned with the scenes portrayed, which we find in works of the same kind by other masters. If we look at Rubens's Village Fête in the Louvre, the ring of peasants wheel round in the dance with a drunken merriment which seems in actual motion before us. The smaller picture of the Last Judgment, at Munich, is just as wonderful for this quality of movement, as for its glorious colour and execution. His B of the Amazons, in the same collection, conveys, wonderful degree, the struggle and energy of a Action and life he never failed to represent as no painter has done before or since, and this alone, opinion, entitles him to a place in the very fore of artists.

In landscape, Rubens's facility of execution and gorgeous colour produce a marvellous effect. His hunting-pieces portraits are equally celebrated. The picture comm referred to as the chef-d'œuvre of Rubens is the Des from the Cross, at Antwerp. The best of his works the Munich gallery (principally derived from the Dü collection) and at Blenheim and Vienna. Many fine tures by him remain in Spain, and many of cou twerp.

His principal pupils were Vandyck, Jordaens, Van Thulden, Krayer, Diepenbeck, and Quellin, but most of them imitated the outward characteristics of their master wit catching his fire and energy. The engravers of his school, such as Pontius and Bolswert, succeeded admirably in conveying the general character of those pictures which it would seem most difficult to translate into mere black and white.

We may conclude by saying that Rubens did that for his country which has rarely if ever been accomplished for any other land. At the time of John and Hubert van Eyck, the school of Flanders had obtained the highest pitch of excellence. Those artists united a diligent and minute observation of nature to the finest technical skill and most successful delineation of character and feeling. At a later period this excellence had vanished, and given way to the crude and affected imitation of the Italian masters which we find in Mabuse and Van Orlay. Rubens however a second time placed the Low Countries in the first rank, and by his own genius restored to them a reputation different indeed in kind, but perhaps equal in degree to that which they had formerly enjoyed.

(*Peter Paul Rubens, his Life and Genius*, translated from the German of Dr. Waagen, by Robert R. Noel, edited by Mrs. Jameson, London, 1840, whence the greater part of the information contained in this article is taken; *Edinburgh Review*, No. 146.)

RU'BIA, a genus containing about forty species, found both in Europe and Asia. It belongs to the very large natural family of Rubiaceæ, to which it gives the name which it itself derives from *ruber* (red), in allusion to the red colour yielded by many of the species. This genus is characterised by flowers monopetalous, superior; tube of the calyx ovate globose, limb scarcely any; corol sub-campanulate, rotate, 5-partite; stamens 4-5, short; styles two, short; berries two, one-seeded. Amongst the numerous species several are employed in medicine and in the arts; in the latter for the sake of the colouring matter, which is contained in the roots. R. tinctorum, madder, has been long known, and was employed in medicine even in the time of Hippocrates, but is valued chiefly as a dye. It is a native of Europe and Asia Minor, but is now extensively cultivated in Holland and France; the culture has likewise been attempted, and successfully, in this country, but the English madder could not be sold so cheap as the foreign; it is therefore still largely imported, chiefly from Holland, France, Italy, Turkey, though since cochineal has become

it is much used for the same purposes. It is em-
dyers and calico-printers as a red and scarlet dye.
o the singular property of turning red the bones
tions of fowls and other animals fed on it.
lifolia (*Munjista*), the *Munjeet* of India, a native of
&c., possesses very similar properties, and is im-
to England from Calcutta. The root is used as a
e for that of R. tinctorum; it is known in com-
der the name of East Indian madder, and is also
in medicine. Like madder, munjeet was pro-
own from very early times, as *rodeen* is given as
k name in Persian works on Materia Medica. R.
and R. Relbun, both natives of South America,
steemed there as dyes.

CON. [CÆSAR, C. J.]

E. [MONEY.]

IC (from the Latin *ruber*, red), a name given to
of chapters in certain antient law-books; and
ecially to the rules and directions laid down in our
or regulating the order of the service. These, in
ances, were formerly written or printed, as the
nt be, for distinction's sake in red characters, and
ined the name though now printed in black.

S (the Latin *rubus*, a bramble), a genus of plants
to the natural order Rosaceæ, and to the section
eæ of the suborder Rosaceæ proper. This genus,
of Rosa, has proved a source of difficulty and differ-
ngst botanists. Some writers on the British Flora
ibed upwards of twenty-five species, whilst others
uced them to four or five, or even two.

llowing excellent description of this genus from
'British Flora' has been drawn up by Mr. Borrer,
nvestigated the British species with more success
other botanist:—

-like plants or *herbs*, with perennial *roots*. The
r nothing very peculiar. In some species of the
e *stem* is upright, or merely curved at the top; but
eater number it is either prostrate, or, as is more
the case, assurgent, arched, and decurved; and
of the shoot and of the side branches, if it produce
ss prevented by circumstances from reaching the
ake root in the latter part of the year. In the
e shoot is partially destroyed, the part next to the
oot surviving to produce flowering branches dur-
nsuing summer, and usually dying after the fruit
erfected; young shoots meanwhile springing up by
The rooted ends also become distinct plants at
istances from the parent root, often many yards.
e of growth adds much to the difficulties in the
ation of the species; since an acquaintance with
leafy shoot and the floriferous stem, formed in the
ar from its remains, is necessary. The best cha-
e found in the figure, the arms, and the leaves of
er. The *leaves* in all the British species of this
re, occasionally at least, quinate, and, with one
digitate, or somewhat pedate from a partial junc-
e stalks of the two lateral pairs of leaflets; the
errated, for the most part unequally and irregu-
prickles on the leaf-stalks more curved than
e of the stem. In some species the *inflorescence*
able, but in general the panicle varies so much as
no good distinction, nor can the arms of the calyx
rm of its segment be depended on. The *petals*
delicate and crumpled, and in several species very
ble in size and width. There are some differences
uit, but they are rarely discriminative. In ex-
the figure of the leaves, the central leaflet is to be
the lateral ones are always smaller and of a nar-
portion. In several species the leaves occasionally
mild winter, and are found the next season sub-
lowering branches. The leaves of these branches
s determinate figure; the number of their *leaflets*
d as they approach the inflorescence, and their
supplied in the upper part of the panicle by first
then simple *bracteas*, formed by the coalescence
pules. These last are usually long and narrow,
sometimes toothed or jagged, and issue from the
or the most part, a little above its base. They
distinguishing characters.' This description ap-
ally to the foreign species as to those of Britain.
tial characters of the genus are:—calyx 5-cleft;
Fruit superior, of several single-seeded juicy
laced upon a protuberant spongy receptacle. The
species are universally diffused over the mountainous and temperate regions of the Old and New World.

As a group of plants this genus is more interesting to the botanist than the horticulturist, but at the same time several species are cultivated both as ornaments and on account of their agreeable, acid, and astringent fruit.

One hundred and forty-seven species of this genus are enumerated by Don, in Miller's 'Dictionary,' which are divided according to the character of their leaves. The first division is known by the plants having pinnate leaves and from three to seven leaflets. The most remarkable of these is the *Rubus Idæus*, Common Raspberry, or Mount Ida bramble, well known for its crimson edible fruit. [RASPBERRY.] The whole plant is villose, stem round, with slender recurved prickles; leaves pinnate, with 5 or 3 ovate serrated leaflets, tomentose beneath; flowers drooping; petals obovate, wedge-shaped, entire, conniving shorter than the calyx; carpels numerous, tomentose. It is a native of woods in Europe, from Norway and Sweden to Spain and Greece. It is found also in Asia on the Himalaya, in the North of Africa, and in America from Canada to Pennsylvania. It is found abundantly in almost every part of Great Britain and Ireland. The fruits are called raspberries, and are very generally eaten. They enter into the composition of different syrups, jams, jellies, ratafias, and ices, and are preserved either alone or with currants. Raspberry-wine is much used in Poland. Raspberries are sometimes dried in ovens for winter use. Raspberry-vinegar is not only an agreeable beverage, but is said to act as a febrifuge. They are amongst the most agreeable of garden fruits when properly cultivated, and when ripe may be eaten in almost any quantity with impunity.

Rubus suberectus, Upright Bramble, is known by its nearly upright, not rooting, obsoletely angular stem, uniform few and small prickles, lower pair of leaflets sessile or nearly so, and panicle nearly simple. The stems are between three and four feet high. The fruit consists of a number of small dark-red aggregated carpels, which have something the flavour of the raspberry, and hence recommended for cultivation. It is a British species, and grows on boggy heaths, by the sides of streams, &c., chiefly in mountainous districts of the North.

Rubus micranthus, Small-flowered Bramble, has an upright, round, branched stem, pinnate leaves, with 5-7 oblong, ovate, doubly serrate, tomentose beneath, and green above leaflets, with small reddish-purple flowers arranged in corymbs, and black fruit. It is a native of Nepaul, and one of the most gigantic of the genus, attaining a height of eight or nine feet. It is easily distinguished by its nearly erect, strong, smooth, dark mahogany-coloured shoots, and very long pinnate leaves. The shoots sometimes attain a length of 20 feet. There are two other species, *R. distans* and *R. asper*, found with this in Nepal, which have been grown in this country.

R. occidentalis, the Western Bramble, is a native of Canada and the West Indies, and was introduced into this country in 1696. It has umbellate flowers, and fruit like the raspberry, but black, and grows to the height of 4 or 6 feet.

The second division is known by the plants having digitate leaves, with from three to five leaflets.

The Grey Bramble, or Dewberry (*Rubus cæsius*), is known by the following characters:—Stem trailing, round or nearly so, glaucous; prickles straight, unequal, passing insensibly into setæ, the length of the largest rarely equalling the diameter of the stem; leaves digitate, of 3 or more rarely 5 ovate leaflets, the outermost sessile; calyx embracing the fruit. It is a native of Europe and the North-East of Asia, in woods and hedges. Many of the species described by botanists may be referred to this; the most important of these are *R. Sprengelii*, *R. dumetorum*, *R. foliolosus*, *R. flagellaris*, *R. corylifiorus*. The last, the Hazel-leaved Bramble, is admitted as a species by most British botanists. It is known by its stem being decurved and roundish, prickles straight, passing into setæ; leaves digitate, with 5 ovate leaflets; fruit spreading or reflexed. It is generally a much larger and stronger plant than *R. cæsius*. Dr Lindley refers several of the species of the German botanists Weihe and Nees, to the *R. corylifiorus*, which he admits as a genuine species.

Rubus spectabilis, Showy Bramble, is one of the handsomest of the genus. It has a glabrous stem, not bearing prickles; leaf of three ovate, acute, doubly and unequally serrated leaflets, downy beneath; flowers of an agreeable purplish colour, on terminal peduncles. It is an elegant shrub, growing to the height of four or five feet. It flowers in April and May, and has a large dark-yellow fruit, of an acid and astringent taste. It was brought from the banks of the Columbia river, in North America, by Mr. Douglas, in 1827, and is very deserving of cultivation.

Rubus fruticosus, Shrubby Bramble, or Common Blackberry, is one of the most common species of the genus. It has a 5-angled erect stem, rather tomentose, bearing recurved prickles, 3 5 leaflets, each on a secondary petiole; rose-coloured or white flowers arranged on a panicle; reflexed sepals, almost without prickles; purplish black fruit. It is a native of almost all Europe, in hedges, thickets, and woods. There are not less than ten generally admitted varieties of this species, and some botanists make many more. The fruit of this species and its varieties are well known as blackberries, or bumblekites, and also scald-berries, from their supposed power of giving scald-head to children. Wherever they grow, they are picked by the children of the district on account of their agreeable acid flavour. Sometimes they are employed in making an inferior wine, and also for the distillation of a spirit. They are frequently used by the inhabitants of rural districts for making tarts. The red muscat of Toulon is coloured by their juice. Medical properties have been attributed to them, but they are not now used. Both the fruit and leaves are employed in the arts, for colouring and dyeing. The *R. fruticosus* is a good plant for growing on loose dry ground for the purpose of fixing it previous to planting forest-trees. The shoots are used by thatchers for binding their straw, and also for making bee-hives. It is sometimes cultivated in order to produce a picturesque effect in gardening.

One of the most diminutive plants of the genus is the *R. arcticus*, the Arctic Bramble. It has three glabrous obtusely-serrated leaflets, no runners, stem bearing only one flower, and without prickles, the petals notched. It is a native of the mountainous and colder regions of Europe. Its stem never attains a greater height than six inches, and is furnished with from three to four leaves, with a single large deep rose coloured flower, which is succeeded by a purplish red fruit highly prized for its flavour among the Swedes.

A third division of the brambles have their leaves singly lobed, not digitate or pinnate. A well known species of this division is *R. odoratus*, the Sweet-scented Bramble. It has an upright stem, with large showy red flowers, numerous ovate velvety carpels, and red fruit. It is a native of North America, in the woods of Canada, and the Alleghanies. It grows to the height of four or five feet, and is called *odoratus* on account of the fragrance of its foliage. Another American species, resembling the last, is the *R. nutkanus*, the Nootka-Sound Bramble. It flowers from May to October. Its flowers are white, succeeded by large red berries.

Rubus chamæmorus, the Cloud-berry, is known by its diœcious flowers, simple-lobed leaves, and herbaceous single-flowered stem without prickles. It grows in great abundance on the Scotch Highlands, and, under the name of roebuck-berries and knot-berries, the fruit is gathered in great quantities by the inhabitants of those districts. They have an agreeable flavour, and form a useful article of diet where they grow in sufficient number to be worth gathering. This plant is one of the smallest of the genus, never growing more than eight or ten inches high. It is the badge of the clan of M'Farlane.

Further information on the genus Rubus is contained in Hooker's 'British Flora;' Lindley's 'Synopsis of the British Flora;' Don's 'Miller's Dictionary;' Weihe and Nees' 'Rubi Germanici;' and Loudon's 'Arboretum.'

RUBY. [Corundum.]

RUD or RED EYE. [Leuciscus.]

RUDBE'CKIA, a genus of plants dedicated by Linnæus to the memory of his predecessors the Rudbecks, father and son, in the botanical chair at Upsal. It belongs to the natural order Compositæ, and possesses many species. Some of these are well known in gardens. They are herbaceous, biennial, and perennial. All the sorts may be raised from seeds, which should be sown in April, and when the plants are two or three inches high they may be pricked out into nursery-rows till autumn, when they should be planted out where they are to remain. They may also be increased by offsets.'

RUDDER. [Ship.]

RUDDIMAN, THOMAS, was born in October, 1674, at Raggel, in the parish of Boyndie and county of Banff, Scotland. He was instructed in Latin in the parish school of Boyndie, where he made a rapid progress. At the age of sixteen he obtained, at King's College, Aberdeen, the first exhibition or bursary of the year, on account of his superior knowledge of Latin. Here he studied four years, and then took his degree of master of arts, at which time he was well read in the Roman classics. Soon after this he engaged himself as tutor in a private family, and in the course of another year he became schoolmaster of the parish of Lawrence Kirk. He remained here three years and a half, and then, through the interest of Dr. Pitcairne, he was appointed assistant-keeper of the advocates' library at Edinburgh. In this office, though he had good opportunities of becoming known, and of reading and teaching for his further improvement, yet his pecuniary advantages were so small that he was obliged, in 1707, to commence auctioneer. In the same year he published an edition of Volusenus's 'Dialogue on Tranquillity of Mind,' with a Life of Volusenus, a Wilson, prefixed. In 1709 he published Johnston's Latin 'Poetical Paraphrase of Solomon's Song' and Johnston's 'Cantica.' He was next invited by the magistrates of Dundee to be rector of the grammar-school there, but he declined the offer. In 1713 his friend Dr. Pitcairne died, and Ruddiman, being still an auctioneer, managed the sale of his library, which was purchased by Peter the Great, of Russia. In 1714 he published his 'Rudiments of Latin Tongue,' a book which is well known, and is still in most of the schools in Scotland. In 1715 he pu an edition of Buchanan's works, in two volumes, folio, the same year he commenced printer, in partnership brother who had been brought up to the business; and years afterwards he was appointed printer to the Uni of Edinburgh. He published, in 1725, the first p 'Grammaticæ Latinæ Institutiones,' which treats of et logy: and in 1732, the second part, which treats of syn He also wrote a copious treatise on prosody, but publis only an abridgement of it. After this time he was principal keeper of the advocates' library. In 17 published Anderson's 'Diplomata et Numismata Scotiæ' During the latter part of his life he was engaged much in controversy with different persons. However 1751 he found time to put forth an edition of Livy, four vols. 12mo, which Dr. Harwood pronounces one the most accurate editions ever published. About time he resigned his post of keeper of the advo library, and was succeeded by David Hume.

Ruddiman died at Edinburgh, January 19, 1757, in eighty-third year of his age. He was author or editor some other publications, besides those above mentioned and among them 'The Caledonian Mercury,' from wh he is said to have derived more profit than reputation. Life of Ruddiman was published by Mr. George Chalmers, 1794, 8vo.

(Chalmers's *Biographical Dictionary; Biographie* *verselle.*)

RUDGELEY. [Staffordshire.]

RUDING, ROGERS, was born at Leicester, August 9, 1751. He was the second son of Rogers Ruding, Esq. Westcotes, a member of a highly respectable family, of notices may be found in Nichols's 'Leicestershire' gentleman was receiver-general for the county, and as came to London to pay the identical money that he ceived into the Treasury. A friend, to whom Ruding tioned this circumstance, suggests the possibility that primitive mode of transacting business may have contribute in some degree to direct the mind of his son to the su of money transactions. The subject of this article was cated at Merton College, Oxford, of which he was some Fellow, and by which he was presented, in 1793, to vicarage of Maldon and Chessington, two small adjoining parishes in Surrey, which are always held together, if legally united. He took the degrees of B.A., 1771; M. 1775; and B.D., 1782. Mr. Ruding married a cousin the same name, and by her had three sons, none of wh survived him, and two daughters.

Ruding's attention appears to have been early dire to the defects of our monetary system, and in 17 published a pamphlet, entitled 'A Proposal for resto the antient Constitution of the Mint, so far as r to the expense of Coinage: together with a plan

rovement of Money, and for increasing the diffi-
Counterfeiting.' In 1812 he issued proposals for
work, which was published in 1817, in four quarto
under the name of 'Annals of the Coinage of Bri-
its dependencies, from the earliest period of au-
istory to the end of the fiftieth year of his present
King George III.' The whole of the first edition
ld within six months, it was shortly followed by
in octavo, which brought down the history to the
of the year 1818; the additional matter being also
in the form of a supplement to the first edition.
portant work, on the compilation of which Mr. Ru-
stowed no ordinary amount of laborious research,
a chronological history of the monetary affairs of
ntry, the constitution of the Mint, the process of
and the numerous and often ineffectual measures
to prevent the deterioration and counterfeiting of
y. It also embraces an account, geographically ar-
f all the Mints and Exchanges formerly existing in
arts of the kingdom; and a description of the coins,
d by a series of more than a hundred plates, inclu-
se previously published as tables of English gold
er coins, by Martin Folkes, Esq., which were lent
ociety of Antiquaries for the purpose.

d simply as an historical work, Ruding's 'Annals of
age' is a book of great value and interest, embra-
t does the result of the author's diligent investiga-
subject to which very few could devote sufficient
; but the work had another object, which may be
l by an extract from the author's preface. He ob-
Had these materials been collected for no other
than the amusement of antiquarian curiosity, I
ave held myself blameable for the misapplication of
ecious time. But this work is given to the world
igher and more important view. Its object is to
om the experience of ages, the inadequacy of
ent, however severe, to prevent the commission of
e of counterfeiting the money, whilst the tempta-
t remains so powerful, and the execution of it so
e long succession of penal statutes, and the innu-
lives which have been forfeited to them, seem to
at the system is radically defective, and that the
n be prevented only by counteracting and weaken-
force of the temptation.' Ruding considered his
be supported by the great re-coinage of 1816 and
which time the weight of the coins was so far dimi-
to remove the temptation to melting them down,
coarseness of the workmanship afforded such fa-
mitation, that the real coins and the counterfeits
ly for delivery almost at the same instant. A new
this important work, extended to the commence-
the reign of Victoria, has lately been published by
ne, in three volumes, quarto. It is edited by J.
an, Esq., aided by other numismatists; and, while
of Ruding is preserved unaltered, it is enriched
y additional notes and tables, and upwards of forty
s of coins.

ding communicated many papers on coins, &c. to
tleman's Magazine,' and memoirs on the trial of
d the office of cuneator (which were, in fact, little
n chapters of his larger work, perhaps put forth in
to excite interest on the subject) to the 17th and
mes of the 'Archæologia' of the Society of Antiqua-
hich he was a fellow. He was also an honorary
of the Antiquarian Society of Newcastle-upon-
le died at Maldon, on the 16th of February, 1820,
ty-ninth year.

LPH of HABSBURG. [HABSBURG, HOUSE OF.]

LPHINE TABLES. [KEPLER.]

LPHUS, Schumacher's name for the *Monoceros*
s. [ENTOMOSTOMATA, vol. ix., p. 458.]

LSTADT. [SCHWARZBURG.]

LLIA, a genus of plants of the natural family of
eæ, which was so named by Linnæus in compli-
. Ruelle, physician of Francis I., who wrote com-
on Dioscorides, as well as some other botanical
The genus, as formerly constituted, embraced a
ny Indian species, which are now distributed among
er genera, as Adenosma, Hygrophila, Dyschoriste,
thus, Petalidium, Calophanes, Buteræa, Strobi-
Echmanthera, Goldfussia, Asystasia, Leptocanthus,
. The genus is distributed through the tropical
sia, including the tropical and subtropical parts of New Holland. It includes many highly ornamental plants, as are also those which have now been excluded from it; all are easily cultivated, and often to be seen in our hothouses. Some of the species which have now been removed to other genera are found at considerable elevations on the sides of the Himalayan Mountains; of these the most remarkable is Æchmanthera, formerly Ruellia gossypina, which has its stems covered with a thick coating of white tomentum, which probably enables it to withstand a greater degree of cold than most others of the family.

RUFI'NUS, also called **TORANUS**, a priest of Aquileia, and, according to some writers, a native of that place, was born about the middle of the fourth century. He embraced a monastic life, and lived at first in a monastery at Aquileia, where he devoted himself to the study of the Scriptures and of the Greek and Latin fathers. During this time he became acquainted with St. Jerome, who was for a long time most sincerely attached to him. Rufinus subsequently visited Egypt, where he formed the friendship of St. Melania, who was celebrated in the church for her works of charity and love. He afterwards went to Palestine, where he encountered the opposition of the Arians, who banished him to the most desolate part of the country. He was ransomed however by Melania, and returned with her to Jerusalem, where he built a monastery on Mount Olivet, and lived for many years. During his stay at Jerusalem he translated some of Origen's works, by which he offended his former friend Jerome, who attacked him in his 'Apology.' To this work Rufinus replied, in which he maintained his own orthodoxy and defended himself by appealing to the example of Jerome, who had formerly praised and also translated some of Origen's works. This controversy excited a great stir at the time, as both writers were of high reputation and had many partisans. The Western church however was generally opposed to Rufinus, and on his return to Aquileia he was cited by Anastasius, the bishop of Rome, to appear before him; and on his not doing so, his writings were condemned, and he was deprived of his rank as presbyter at Aquileia. He subsequently retired to Sicily, where he died about the year 410.

Rufinus translated into Latin the works of Josephus; the 'Ecclesiastical History' of Eusebius, to which he added two books continuing the history to the death of Theodosius; the books of Recognitions attributed to Clement, several of Origen's works, with the first book of Pamphilus's 'Apology' for Origen, the 'Orations' of St. Gregory Nazianzen, the ascetical rules of St. Basil, and a few other smaller treatises of the Greek fathers. The translations of Rufinus are rather paraphrases than strict and literal versions. Besides these translations, Rufinus wrote two books in reply to St. Jerome, which have been already mentioned; an 'Apology' to Anastasius, bishop of Rome; an 'Explanation of Jacob's Blessing,' a 'Commentary upon Hosea, Joel, and Amos;' and an 'Explanation of the Apostle's Creed,' a work which is considered by modern theologians of considerable importance, as it contains a complete catalogue of the books of the Old and New Testament.

The opinion of Du Pin upon the literary and theological merits of Rufinus is just and impartial: 'It must be acknowledged that Rufinus, though very ill used by St. Jerome, was one of the ablest men of his time. Perhaps he had not so much learning as St. Jerome, but his temper was better and less violent. He doth not write such good Latin, but his style is more even. It cannot be denied that the Latin church is indebted to him for the knowledge of the most considerable among the Greek authors, and particularly of church history. Though he was accused of divers errors, yet he was convicted of none, and he justified himself sufficiently from the reproachful objections made against him.'

The works of Rufinus were published by Sonnius, in one volume folio, Paris, 1580.

(Du Pin, *A New History of Ecclesiastical Writers*, vol. iii., pp. 107-111, transl.; Lardner, *Credibility of the Gospel History*, vol. iv., p. 482, Lond., 1831, and the references there given.)

RUFUS, or **RUPHUS** (Ῥοῦφος), commonly called Rufus Ephesius, from the place of his birth, is said by Abulfaraj (*Hist. Dynast.*, p. 59) to have lived in the time of Plato, about four hundred years before Christ; John Tzetzes calls him the physician to Cleopatra, who died B.C. 30 (*Chil.*, vi.; *Hist.*, 44, v. 300, p. 104); but Sprengel (*Hist. de la Méd.* and most modern authors follow Suidas in placing him in the reign of Trajan, about the beginning of the second century after Christ. He is sometimes confounded with Menius Rufus, the inventor of several compound medicines, who however must have lived long before the reign of Trajan, as he is quoted by Andromachus (Galen, *De Compos. Medicam. sec. Loca*, lib. vii., tom. xiii., cap. v., p. 92), who was archiater to the emperor Nero. Nothing is known of the events of his life, except that he wrote several works, of which the titles are preserved by Galen and Suidas, and three are still extant.

The first consists of three or four books,* entitled *περὶ ὀνομασίας τῶν τοῦ ἀνθρώπου μορίων*, 'De Appellationibus Partium Corporis Humani,' which are chiefly valuable for the information they impart concerning the state of anatomical science before the time of Galen. His principal object in this work was to give a general idea of anatomy, and particularly to prevent the medical students of his time from making mistakes in reading the antient authors, who do not always call the same parts of the body by the same name. From what Rufus says in this book (p. 33), we find that all the anatomical demonstrations were made upon beasts. (Compare Theophilus, 'De Corp. Hum. Fabr.,' lib. v., cap. ii., who says, 'choose an ape for dissection, if you have one; if not, take a bear; and if you have not a bear, take any animal you can get.') He considered the spleen to be absolutely useless. (p. 59.) We find also in the same book, that the nerves now called *recurrent* were then quite recently discovered. 'The antients,' said Rufus (p. 42), called the arteries of the neck *καρωτίδες*, or *καρωτικοί*, because they believed that when they were pressed hard, the animal became sleepy and lost its voice; but in our age it has been discovered that this accident does not proceed from pressing upon these arteries, but upon the nerves contiguous to them.' He shows that the nerves proceed from the brain, and he divides them into two classes, those of sensibility and those of motion (p. 36), though, like Celsus (*De Medic.*, lib. vii., cap. 18, p. 413, ed. Argent.), he reckons (p. 41; compare p. 43) among them the cremaster muscle. (Julius Pollux, himself a contemporary of Galen, gives also the name of *νεῦρα* to the ligaments which unite the bones: *Onomast.*, lib. ii., cap. 5, segm. 234, p. 265.) According to Sprengel (*Hist. de la Méd.*), he was the first to describe, though very imperfectly, the commissure of the optic nerves at the height of the infundibulum, and the fibres which they receive from that part of the brain. (p. 54.) He clearly describes the capsule of the crystalline lens by the term *ὑμὴν φακοειδής*, *lenticular membrane.* (p. 37.) He considered the heart to be the seat of life, and noticed that the left ventricle is smaller and thicker than the right. (p. 37.) This work was first published in a Latin translation, by J. P. Crassus, with Aretæus, Venet., 1552, 4to.

The next work of his that remains is a valuable little treatise, *περὶ τῶν ἐν νεφροῖς καὶ κύστει παθῶν*, 'De Renum Vesicaque Morbis,' in which however there is nothing that requires particular notice here. The third is a fragment, *περὶ τῶν φαρμάκων καθαρτικῶν*, 'De Medicamentis Purgantibus.'

These three works were first published in Greek, by J. Goupyl, Paris, 8vo., 1554. There is an edition by Clinch, Greek and Latin, Lond., 1726, 4to., which is not of much value. The most complete is that by Matthæi, Mosq., 1806, 8vo., Græce, in which he has supplied, from a manuscript at Moscow, several fragments that had never before been published. A Latin translation of Rufus is inserted in the 'Medicæ Artis Principes,' by H. Stephens, Paris, 1567, fol. Some Greek fragments are to be found in the fourth volume (pp. 195-200) of the collection of 'Classici Auctores è Vaticanis Codicibus editi,' published by Angelo Mai, Romæ, 8vo., 1831. C. G. Kühn published, Lips., 1831, 'Rufi Ephesii de Medicam. Purgant. Fragm. è Cod. Paris. descript.;' and F. Osann wrote a dissertation, 'De Loco Rufi Ephes. Med. ap. Oribasium servato, sive de Peste Lib.,' Giss., 1833. There are also several fragments preserved by Oribasius and Aëtius and among the rest the formula for the composition of a celebrated medicine called *Hiera* (Oribas., *Synops.*, lib. iii., pp. 121, 122), which appears to have been a common name among the antients, for what may be called patent medicines, as Aëtius has inserted in his compilation (Tetrab. i., serm. 3, cap. 114) the formula of one called, after the celebrated Archigenes, 'Hiera Archigenis.'

Haller is inclined to attribute to Rufus (*Biblioth. Botan.*, tom. i., p. 108) an anonymous fragment of one hundred and ninety Greek hexameter verses, *περὶ βοτανῶν*, 'De Viribus Herbarum,' which was first published in the Aldine edition of Dioscorides, Venet., 1518, 4to., p. 231, &c., and which is inserted by Fabricius, with Greek scholia and a Latin translation and notes, by J. Rentorf, in his 'Bibliotheca Græca,' tom. ii., pp. 629-661 (old edit.). Fabricius and others have also been of the same opinion. Hermann, on metrical grounds (*Orphica*, Lips., 1805, 8vo., pp. 717, 750, 761, &c.), determines the writer to have lived some time between Manetho, the author of the *ἀποτελεσματικά*, and Nonnus, the author of the 'Dionysiaca;' but this date is sufficiently vague. Rufus certainly composed a poem in Greek hexameters, *περὶ βοτανῶν*, in four books, which are mentioned by Galen (*De Facult. Simplic. Medic.*, lib. vi., Præfat., tom. xi., p. 796, ed. Kühn), and of which he quotes a few lines (*De Compos. Medic. sec. Loca*, lib. i., cap. 1, tom. xii., p. 425); but this is supposed by Choulant (*Handbuch der Bücherkunde für die Aeltere Medicin*, 8vo., Leipzig, 1825) to have been quite a different work from the fragment now spoken of, chiefly on the ground that so scientific and sensible a physician as Rufus would not have written anything so full of popular superstitions and absurdities. The fragment treats of thirteen different plants in as many chapters, in [illegible] says Haller, 'Medicarum virium adest farrago verar[illegible] falsarum.'

RUGBY. [Warwickshire.]

RÜGEN is the largest of all the islands belonging to Germany, and, together with several small adjacent islands, forms the circle of Bergen in the government of Stralsund, [illegible] the province of Pomerania. This island has an area of [illegible] square miles and was formerly much larger: a part of it, probably above one half, was swallowed up in the middle ages by the sea. It is separated from the continent, with which it is supposed to have been formerly joined, by arm of the sea at least a mile broad. Its shape is very i[illegible]gular, being deeply indented by the sea in various dire[illegible] so as to look like a number of peninsulas united by a comparatively small nucleus in the centre. On the east side the peninsula of Jasmund is connected with the mainland by the steep ridge called Prora, and by a long, narrow, and high wall of flint, granite, and porphyry boulders. In this peninsula is the Stubbenitz, a considerable beech-forest, containing the Berg or Black Lake, an oval spot surrounded with a high wall, which is believed to be the place where the goddess Hertha was worshipped. (Tacitus, *Germ.*, c. 40.) whole island abounds in grotesque and romantic scenery. On the west it is level, but rises in the interior, and northern coasts consist in general of rugged steep cliffs. One of the most considerable eminences in island is Mount Rugard, on which the residence of princes formerly stood. On the north point of Jasmund Stubbenkammer, a lofty chalk cliff, which rises perpendicularly from the sea in the most irregular forms. The highest point, 565 feet (some say 543 feet) above the sea, is called the Königstuhl (the king's chair, or King Frederic W[illegible] chair), from which a flight of 600 steps cut in the rock [illegible] down to the strand. Jasmund is connected by a narrow s[illegible] of alluvial soil with the peninsula of Wittow, a level [illegible] with a rich soil, terminating in the promontory of Arkona, the most northern point of Germany. Arkona con[illegible] a very strong fortress, which was taken in 1168 by [illegible]mar I., king of Denmark, who destroyed the chief t[illegible] the god Swantewic, who was highly revered by the h[illegible] of the north. Large tumuli (called Hünengräber), are in several parts. The whole island, especially the peninsulas of Wittow and Jasmund, is much more fertile [illegible] the continental part of the government of Stralsund. produces much corn. The number of cattle is consi[illegible] and the fisheries productive. The inhabitants [illegible] 29,000; they are very industrious, expert sailors [illegible] men, and very hospitable. The nobility are very n[illegible] Bergen, the capital of the island, has 2600 inhabitants. Rügen is much frequented by travellers on account of [illegible] beautiful scenery, and for the benefit of the sea-b[illegible] This island was ceded to Prussia in 1815, as a part [illegible] Swedish Pomerania.

(Hassel's *Geography*, vol. iii.; *Conversations Lexicon*; Stein; Cannabich, &c.)

RU'HNKEN, DAVID, was born in 1723, at St[illegible] in Pomerania. His parents, who were in good circu[illegible] soon discovered the promising talents of the boy, [illegible] a course of elementary instruction, they sent him to the

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* There are in fact only *three* books, as the second is a sort of *alter primus*, or later edition of the first

um of Königsberg (Collegium Fridericianum, or
ıs-Collegium). Here he commenced his acquain-
th the clas-ical writers of antiquity, and conceived
for them which distinguished his whole life. He
le great progress in the fine arts, particularly in
d drawing. After finishing his studies at the gym-
it was the wish of his parents that he should become
t of theology; but this was contrary to his own in-
, and he obtained permission to go to Göttingen,
anticipated great benefit from the instruction of
sner. On his journey thither he passed through
rg, and the kindness and hospitable reception which
ienced in the houses of two distinguished profes-
hat university, Berger and Ritter, induced him to
Vittenberg, where he remained for two years, and
nost indefatigably to the study of antient literature,
nd jurisprudence. On the occasion of taking his
e published his inaugural dissertation, 'De Galla
Augusta' (Wittenb., 1743), a work which raised the
expectations of the young scholar. Ernesti, who
l to be at Wittenberg at the time, advised Ruhnken
Leyden, and finish his studies under the auspices
reat Hemsterhuis. This advice coincided with
's own wishes; and having provided himself with
introduction, he went to Leyden. To Hemsterhuis
o introduction, but he nevertheless, immediately
arrival, paid a visit to this renowned scholar, who
him with the utmost kindness. Rubnken now
s studies afresh, following the suggestions and
his great master, and continued his studies under
six years, during which he read almost all the
iters with the greatest care and attention. But not-
ling his severe application, he was fond of amuse-
usical entertainments, the conversation of ladies,
ing, were now, and remained during his whole
favourite recreations; and often, after returning
ting, he would sit down all night at his writing-
l make up for the time spent on his amusements.
uis had from his first acquaintance with him dis-
ho great abilities of his pupil, and was anxious to
at Leyden; but as there was at the time no pro-
professorship becoming vacant in the university,
d him to resume his former study of the Roman
hnken, who was accustomed to follow the advice
erhuis like that of a father, complied with his
nd soon made such progress as to gain a consider-
tation as a jurist. But he did not neglect his
pursuits, and made preparations for a new edition
With this view he collected the scholia on Plato,
hed a very valuable edition of Timaeus, 'Lexicon
tonicarum,' with a commentary, Leyden, 1754. (A
much improved edition appeared in 1789.) But
no appointment in Holland, his friends in Ger-
ed him to return and apply for a professorship in
ersity in his own country. His attachment how-
is friend and master, and his love of the mode of
yden, induced him to wait there until a vacancy
ur. In 1755 he went to Paris, where he spent a whole
amining the MSS. of the Royal Library and those
ary at St. Germain. About the time when he was
to set out for Spain, he received the intelligence
sterhuis had succeeded in gaining for him the ap-
of lector (reader) in the university of Leyden. In
ity he was the assistant and colleague of his for-
er. Ruhnken returned to Holland, and, in Octo-
he opened his course of lectures by a discourse,
cia Artium et Doctrinarum Inventrice' (printed
in 1757, 4to.). Ruhnken filled this place for four
d his zeal, his success, and his erudition soon
n the reputation of being one of the most eminent
f Holland.

l Oudendorp died, and Ruhnken was appointed
ssor as professor of eloquence and history. In
year J. M. Gesner of Göttingen died, and
was invited to take his chair; but he refused
rable offer, and recommended Heyne in his stead.
f of his attachment to the university of Leyden
ded by a considerable increase of his salary. At
forty Ruhnken married a beautiful and accom-
oung lady, with whom he lived very happily;
year 1769 his wife began to suffer from apoplexy,
t deprived her of speech, and afterwards also of
l in this deplorable state she survived her husband. In 1767, two years before this calamity, Hemsterhuis had died, and Ruhnken, then rector of the university, delivered a noble eulogium on his late friend and patron. This eulogy is known under the name of 'Elogium Tiberii Hemsterhusii,' printed at Leyden in 1768, in 8vo.; a second edition, accompanied by two letters of R. Bentley to Hemsterhuis, appeared in 1789. About this time Ruhnken conceived the plan of making a new and complete edition of the great works of Fabricius, the Bibliotheca Graeca and Latina, but this plan has never been realized, and other works, of which we subjoin a list, occupied almost all his attention. In 1774 Ruhnken succeeded Gronovius in the office of librarian to the university, in which capacity he enriched the library with a great many valuable books and MSS.

The life of Ruhnken henceforward presents scarcely any incidents: his time was divided between the discharge of his official duties and his literary occupations, by which he acquired a reputation equal to that of his master Hemsterhuis. To his suffering wife he always showed the greatest affection, and all the leisure hours which he could spare he devoted to her. The only thing which in some degree interrupted his quiet pursuits were the disturbances which broke out in Holland in the year 1787. He died on the 14th of May, 1798, leaving two daughters, the younger of whom had from her childhood always been in bad health. The city of Leyden purchased his valuable library, and granted to his widow an annual pension of 500 florins.

Ruhnken was one of the most eminent scholars and critics of the 18th century. With a refined taste and great acuteness, he combined an extraordinary memory and immense erudition. His critical sagacity and his grammatical knowledge were not inferior to those of any modern philologist, and his works are still an inexhaustible source of information, though it has, perhaps not unjustly, been observed, that Ruhnken, as a critic, is more refined and elegant than profound. As a Latin writer Ruhnken has scarcely been excelled by any modern author. In teaching he was very successful; the most distinguished among his pupils was Daniel Wyttenbach, to whom we are indebted for an eloquent Life of his master (Leyden, 1799, 8vo.). This Life was reprinted at Leipzig in 1822, and edited by Lindemann, together with the Elogium Hemsterhusii, under the title 'Vitae duum Virorum Tib. Hemsterhusii et D. Ruhnkenii.'

Besides his edition of the Lexicon of Timaeus, Ruhnken wrote, in 1754, a commentary on the title in the Digest and Code, 'De Postulando, sive de Advocatis et Procuratoribus.' He also edited the second volume of Alberti's Hesychius, with notes and emendations, Leyden, 1766, fol.; Rutilius Lupus, 'De Figuris Sententiarum et Elocutionis,' Leyden, 1768 (a new edition of this work was published at Leipzig in 1831 by Frotscher); Velleius Paterculus, 2 vols., Leyden, 1779 (a separate edition of Ruhnken's commentary was published at Hanover, in 1815, by Cludius); 'Homeri Hymnus in Cererem,' with a Latin translation and commentary, 1780 (a second edition appeared in 1782, in which a fragment until then unknown, was added); 'Mureti Opera,' 4 vols. 8vo., Leyden, 1789. Besides these editions of antient authors by Ruhnken himself, he communicated to Ernesti his remarks on Callimachus (Leipzig, 1761), and on Xenophon's 'Memorabilia' (Leipzig, 1773), and to Schweighaüser those on Polybius and Appian. Besides his three original compositions already mentioned (viz. on 'Galla Placidia Augusta,' 'De Graecia Art. et Doctr. Inventr.,' and the 'Elogium Hemsterhusii'), Ruhnken wrote 'Epistolae Criticae: prima in Homeridarum Hymnos et Hesiodum' (Leyden, 1749); 'secunda in Callimachum et Apollonium Rhodium' (Leyden, 1751); 'Oratio de Doctore Umbratico,' 1753, 4to; 'Dissertatio de Vita et Scriptis Longini,' 1766, 4to. (reprinted in Toup's edition of Longinus). These discourses and essays were collected and published by Ruhnken himself in 1797, in 2 vols., under the title 'Ruhnkenii Opuscula Oratoria, Philologica, Critica, nunc primum conjunctim edita.' A new edition, with some additional dissertations, was edited by Bergmann, in 2 vols., Leyden, 1823. Some parts of the correspondence of Ruhnken with his learned friends have likewise been published. J. A. H. Tittmann has edited 'Ruhnkenii, Valckenarii, et aliorum ad J. A. Ernesti Epistolae; accedunt Ruhnkenii Observationes in Callimachum,' &c., Leipzig, 1812. Mahne has edited 'Ruhnkenii et Valckenarii Epistolae mutuae,' Vliessingen, 1832, and 'Ruhnkenii Epistolae ad Diversos,' Vliessingen, 1834.

RULE, RULER. In a mechanical sense these words are both used for a straight piece of wood, brass, or ivory, from which a straight line is drawn on paper by guiding a pen or pencil along the edge. These rules or rulers are convenient for the laying down of scales, on which point see SCALE; SECTOR; SLIDING-RULE.

The word rule, in its more common sense, means a set of directions for the attainment of any required object, and various rules will be found in this work, scattered under many heads. The word rule is generally dropped; thus we do not speak of the rule of addition, or the rule of subtraction, but simply of addition or subtraction. In some isolated cases the word rule is most usually retained, as in the rule of three [THREE, RULE OF] and the rule of false. [FALSE POSITION.]

A rule differs from an algebraical formula only in the language employed; both the former and the latter indicate processes to the mind. The rule describes its data at length, and requires many more signs than the formula, which however is much more intelligible than the rule, as soon as its symbols are well understood. For example, when it is known that *a*, *b*, *c* are the units in the sides of a right-angled triangle, the formula for determining *c* is—

$$c = \sqrt{(a^2 + b^2)}:$$

the rule is—To find the hypothenuse of a right-angled triangle, multiply the number of units in each side by itself, add the products, and extract the square root of the sum: this square root is the number of units in the hypothenuse required. It might perhaps be thought that the preceding rule might have been expressed more briefly, but the practice of abbreviating the language of rules is almost sure to destroy the sort of advantage which, in one point of view, they possess over a formula. A rule should embody a description of the object to be gained, and the process by which it is to be gained; it should also point out the step at which it is gained, and everything necessary to describe the result. It should even specify the case in which the rule is to be used, or that in which it becomes necessary rather than any other; and should be so complete in itself, that any reader of that class to whom the book is addressed might learn all it teaches (that is, everything but the demonstration) by reading only what comes between the word RULE and the full stop at the end of it. Thus, though we have described the preceding rule in words which some persons may think too many, we should say that they are not too many for the student who is somewhat of a mathematician, and too few for the beginner. For the latter we should state as follows: —To find the hypothenuse of a right-angled triangle of which the two sides are given, reduce the two sides to the same denomination if necessary (feet and decimals of a foot, inches and decimals of an inch, &c., as most convenient), multiply the units in each side by itself, add the results, and extract the square root of the sum: this square root is the number of such units in the hypothenuse as were used in the expression of the sides.

If however many rules are to be learned, it would in all probability be found more easy to learn the symbols of algebra, that is, to learn to read an algebraic expression, and to use formulæ, than to recur frequently to rules.

RULE OF THREE. [THREE, RULE OF.]

RULE (in Law) is an order of one of the three superior courts of Common Law. Rules are either general or particular.

General rules are such orders relating to matters of practice as are laid down and promulgated by the court for the general guidance of the suitors. They are a declaration of what the court will do, or require to be done, in all matters falling within the terms of the rule, and they resemble in some respects the Roman edict. The power of issuing rules for regulating the practice of each court is considered to be incident to the jurisdiction of the court. By a recent and very important act of parliament (3 & 4 Will. IV., c. 42), the judges were authorised within five years from the date of it (1833) to make rules of a more comprehensive nature, relating especially to pleading in civil actions. These rules, after being laid before both houses of parliament within certain times mentioned in the act, were to have 'the like force and effect as if the provisions contained therein had been expressly enacted by parliament.' In exercise of this authority, a number of rules, generally called 'The New Rules,' have been promulgated, which have introduced very material changes in the mode of pleading. [PLEADING.] (Stephens *on Pleading*; Chitty *on Pleading*; Jervis *on the New Rules*.) Formerly each court of common law issued its own g ral rules, without much consideration as to what was practice in other courts. Of late the object has bee assimilate the practice in all the courts of common

Rules not general are such as are confined to the par lar case in reference to which they have been granted. these, some, which are said to be 'of course,' are draw by the proper officers on the authority of the mere sig of counsel, without any formal application to the co in some instances, as upon a judge's fiat or allowance by master, &c., without any signature by counsel; other quire to be handed in as well as signed by counsel. R which are not of course, are grantable on the application, as it is technically termed, 'the motion,' either of the p actually interested or of his counsel. Where the grou of the motion are required to be particularised, the facts cessary to support it must be stated in an affidavit by c petent witnesses. After the motion is heard, the c either grants or refuses the rule. A rule, when gran may, according to the circumstances, be either 'to s cause,' or it may be 'absolute in the first instance.' T term 'rule to show cause,' also called a 'rule nisi,' me that unless the party against whom it has been obtai shows sufficient cause to the contrary, the rule, which is conditional, will become absolute. After a rule has been obtained, it is drawn up in form by the proper offi and served by the party obtaining it upon the party aga whom it has been obtained, and notice is given him to pear in court on a certain day and show cause against it. may do this either by showing that the facts already closed do not justify the granting of the application, or may contradict those facts by further affidavits. The cou who obtained the rule is then heard in reply. If the co think proper to grant the application, or if no one ap to oppose it, the rule is said to be made 'absolute.' If refuse the application, the rule is said to be 'discharged.'

Rules may be moved for either in reference to an ma already pending before the court, as for a change of ve in an action already commenced, or for a new trial, & or in respect of matters not pending before the court, for a criminal information, a mandamus, &c.

A copy of a rule obtained from the proper officer is le proof of the existence of such a rule. (Tidd's *Pract* Archbold's *Practice*.)

RULE in SHELLEY'S CASE. [REMAINDER.]

RUM, a spirit distilled from the sugar-cane, that 'from cane-juice, or the scummings of the juice from boiling-house, or from the treacle, or molasses, or t 'dunder,' the lees of former distillations.' (Edwards's *W Indies*, vol. ii., p. 279.) As the entire juice of the can not necessary for making rum, the distillation is carried in conjunction with the manufacture of sugar. The best is made from the uncrystallized syrup called mola [MOLASSES.] The proportion of molasses made in cry lizing a cwt. of sugar varies from 50 to 90 gallons, and pends both upon the climate and the season, being lo in the Leeward Islands, which have a dry climate, and h est in Demerara and Trinidad, and it is in the latter tha fine seasons the proportion reaches 90 gallons per Nearly one gallon of proof rum may be made from one lon of molasses. The value of the raw material for a of rum has recently been as high as 1*s*. 10*d*. in the Indies; the cost of distillation averages about 8½*d*. per lon; and for an additional 8½*d*. for freight and o charge the spirit may be brought into the English where, since June, 1830, it has been subject to a du 9*s*. per gallon. This is 1*s*. 6*d*. higher than the duty English spirits, the distillers of the latter claiming to protected on account of the corn-laws raising the raw m rial above its natural price. On the other hand rum protected by heavy duties on foreign spirits; and rum produce of the West Indies has hitherto been protec against East India rum by a different rate, the duty on latter being 15*s*. per gallon.

The rum consumed in the United Kingdom is enti the produce of the West Indies, and to a great extent of island of Jamaica, which is of a superior quality. For m years the home demand has not taken off the whole su and the surplus, which consists chiefly of the Leew Islands rum, and other kinds of inferior quality, is ported. The consumption of rum in this country has b long declining, and the imports and exports have both fa off. In 1839 the number of gallons of rum on which was paid in England was 2,739,363; Scotland, 75,337; Ireland, 15,663: total, 2,830,363 gallons. In 1840 the quantity consumed was 2,510,668 gallons. In 1826 there were 5,051,966 gallons of rum in bond; 3,585,386 gallons in 1836; 2,573,627 gallons in 1838; and 3,007,563 in 1839, of which rather more than one-half was bonded in London, and the remainder at the outports. The proportion of rum consumed is now less than one-tenth of the total consumption of spirits in the United Kingdom, but in 1820 the proportion was about one-fifth. British spirits are said to be extensively sold for rum, the flavour being imitated by the rectifier.

At the present time (April, 1841) a Bill, introduced by the Government, has passed through the Commons, the object of which is to equalize the duty on East and West India rum by reducing the former. Rum made from the date or palm-tree, as well as from the sugar-cane, will be included in this measure, but not if made from any other material. The equalization of the duties on East and West India sugar, by 6 Wm. IV. c. 26, rendered it expedient to give a practical equality to all the products of the sugar-cane, without which the cultivation of sugar-plantations in India could not have been so profitably extended, as the molasses would have been comparatively wasted. The Government measure equalizes the import duty on rum in the colonies as well as in the United Kingdom. Great improvement in East India rum is anticipated from its admission to the English market. In December, 1836, the Lords of the Admiralty rescinded an order which confined the navy contracts to West India rum. The imports of East India rum in 1837 amounted to 67,761 gallons; in 1838, to 45,212 gallons; in 1839, to 170,380 gallons; but none of it was entered for home consumption, in consequence of the high duty.

1. Average quantities of rum annually imported from the West Indies, and Demerara and Berbice, from 1821 to 1838 inclusive, for periods of six years each:—

	1921-1826. Galls.	1827-1832. Galls.	1833-1938. Galls.
Jamaica	2,876,468	3,154,866	2,510,728
Demerara	996,500	1,616,944	1,500,808
Berbice	44,904	173,000	92,968
Trinidad	14,688	21,415	4,875
Tobago	355,188	393,070	297,045
Grenada	264,136	300,247	216,717
St. Vincent's	91,734	163,224	144,254
Barbadoes	862	5,853	1,128
St. Lucia	3,544	17,985	4,659
Dominica	15,160	31,129	18,014
Antigua	42,233	90,773	35,909
St. Kitt's	61,409	153,023	51,387
Nevis	16,229	47,213	15,020
Montserrat	24,327	33,113	14,707
Tortola	3,113	96	3,716
To'al	4,147,659	6,351,957	4,933,164

2. Average quantities of rum annually imported into the United Kingdom, re-exported, consumed, and used as ships' stores and in the navy, in two periods, from 1827 to 1839 inclusive:—

Annual Average.	Imported. Galls.	Re exported. Galls.	Consumed. Galls.	Ships' Stores. Galls.	Navy. Galls.
1827-33	7,182,188	1,756,478	3,581,257	377,654	320,691
1834-39	5,065,800	1,448,024	3,316,498	366,504	308,993

3. Quantities of rum imported into the United Kingdom, distinguishing the imports from the British West Indies, also the quantities consumed and re exported, in each year from 1833 to 1839:—

Years.	Imported.		Paid Duty for Consumption.	Re-exported.
	Total (from all places).	From the Brit. W. Ind.		
	Galls.	Galls.	Galls.	Galls.
1833	5,146,877	5,109,975	3,492,133	1,834,206
1834	5,158,489	5,112,399	3,345,177	1,642,282
1835	5,540,170	5,453,317	3,416,966	1,678,374
1836	4,993,942	4,868,168	3,324,749	1,279,845
1837	4,613,095	4,418,350	3,184,255	1,174,273
1838	4,912,227	4,641,212	3,135,651	1,134,436
1839	5,477,669	4,021,821	2,830,263	1,155,753

In addition to the above, the quantity of rum delivered for the use of the navy and for ship's stores averaged 743,305 gallons annually, all of which (with the exception of 3978 gallons in 1838, and 87,998 gallons in 1839, from the East Indies, admitted into the navy contracts) was the produce of the West Indies.

The duty on rum averaged 1,593,685*l.* for the years 1831-2-3; for the years 1834-5-6 it amounted to 1,399,912*l.*; and for 1837-8-9 it was 1,372,540*l.* In 1840 the gross receipt was 1,154,544*l.*

The exports of rum are chiefly to Germany, Prussia, Holland, Italy, and the Australian colonies.

RUM, Island. [ARGYLESHIRE.]

RUMEX, the name of a genus of plants, from *rumex*, a sort of spike, spear, or halberd, which the shape of its leaves resembles. It belongs to the natural order Polygonaceæ. Most of the species of this genus are well known as troublesome weeds to the agriculturist, under the name of docks and sorrels. Some of them have been used in medicine, but their incomplete flowers and inelegant appearance have caused their almost entire neglect in the garden. The essential characters of the genus are: Calyx with six sepals, the outer three slightly coherent, the inner ones enlarged after flowering; stamens six; styles three, reflexed; stigmata three and cleft; fruit a three-cornered nut, with a lateral embryo and superior radicle. In the descriptions of this genus by botanists, the three inner sepals are often designated as corolla, but it is more consistent with what we know of the general structure of the order Polygonaceæ to refer it to the apetalous or incomplete subclass of Exogens, and thus to consider the flower of Rumex as destitute of corolla. Rumex is nearly allied to Rheum, but may be distinguished from that genus by its three-cornered carpels not having wings, and by the embryo of the seed being lateral, not central as in Rheum. The wings that are observed upon the fruit of some species of Rumex are produced by the calyx.

The species of Rumex that have been chiefly used in medicine are the *R. acetosa* and *hydrolapathum*. *R. acetosa*, common Sorrel, is known by its granular valves, diœcious flowers, oblong awl-shaped leaves, with converging (often notched) lobes. It is indigenous in this country, and it is also common in meadows and grassy pastures throughout Europe, from Lapland to Greece. It flowers early in June. *R. hydrolapathum*, Great Water-Dock, is distinguished from other species, and the foregoing, by the following characters: Sepals petaloid, nearly entire, unequally tuberculated; lanceolate leaves acute at each end; almost leafless whorls. It is found growing in marsh-land ditches, stagnant waters, and the margins of great rivers throughout Europe, as well as in North America from Pennsylvania to Virginia. It is by far the largest and most conspicuous of our indigenous docks; flowering from July to August. This seems to have been the plant known under the name of *Herba Britannica* to Pliny (xxv., c. 3. 8), Galen, and others, and which was employed, on account of its astringent properties, in various diseases in which those remedies are indicated. (Martingius, *De vera Antiquorum Herba Britannica*, Amst., 1681.)

RUMFORD, BENJAMIN, COUNT, was born at Woburn, New England, in 1752. His family name was Thompson. By his marriage he was raised above the necessity of acting as a teacher, in which capacity he had employed himself, and when the Revolution commenced he was a major of militia, and for his services to the king's cause obtained an appointment in the Foreign Office. During the contest he returned to New York, and raised a regiment of dragoons, of which he was appointed colonel. In 1784 he returned to England, was knighted, and is said for some time to have acted as one of the under-secretaries of state. It was subsequently, while in the service of the king of Bavaria, that he prosecuted his most useful labours; amongst which were plans for the suppression of mendicity and for relieving poverty and elevating the poor, besides various civil and military reforms, for which several orders of knighthood were conferred upon him, and he was made a lieutenant-general and created a count. Towards the close of the century he once more came to England, and devoted his time to experiments on the nature and economical application of heat, and assisted in founding the Royal Institution. In 1802 he went to reside at Paris, and married the widow of Lavoisier, the chemist, but soon afterwards separated from her. He then retired to Anteuil, a village near Paris, and having a handsome pension from the king of Bavaria, devoted his time to rural pursuits and to chemistry and natural philosophy. He died in August, 1814.

The plans of Count Rumford for improving the arts and conveniences of domestic life have rendered his name well known in England. An account of these will be found in his 'Essays, Political, Economical, and Philosophical.' Several of these essays were published separately, and effected much good at a time when the amelioration of the condition of the poor was attracting great attention. His views are enlightened as well as benevolent, and on the whole he appears to have been in advance of his time. Two volumes of the 'Essays' were collected and published in 1798, and a third in 1802. In the latter year also was published a volume of 'Papers on Natural Philosophy and Mechanics.' Some of these had been read before the Royal Society, in whose 'Transactions' they are also printed.

RUM-ILI', a large division of European Turkey, which comprehends the central part of it, namely, the countries of Albania, Macedonia, Thessaly, and part of Mœsia. It is bounded on the north by the eyalets of Silistria and of Bosnia; on the east partly by the province of Gallipoli, which belongs to the eyalet of Jezayr, and partly by the Ægæan Sea; on the south by the kingdom of Greece, and on the west by the Adriatic. Rum-ili is an eyalet, or general government under a beglerbeg, who ranks above all other pashas of Europe, and who has under him the following livas or pashaliks:—1, Monastir, which is in general the residence of the beglerbeg himself; this province includes the western and southern parts of Macedonia. The capital, Monastir, called also Bitolia, near the site of the antient Heraclea, not far from the banks of the river Erigonus, an affluent of the Axius, and on the borders of Albania, is a considerable town, with about 15,000 inhabitants; 2, Salonichi, which occupies the eastern pass of Macedonia [THESSALONICA]; 3, Ghiustendil, which embraces the northern part of Macedonia, as far as the sources of the Strymon. It has some rich copper-mines and some copper-works. 4, Uskub, which corresponds to the antient Pæonia. The head town, called Uskub, or Scopia, on the Axius, is the seat of a Greek archbishop; it has some leather manufactories, and about 10,000 inhabitants. 5, Prisrend, or Perzerin, north of Mount Scardus. 6, Krukovatz, or Aladja Hissar, north of Prisrend, as far as the borders of Servia, embracing a part of the former Roman province of Mœsia Superior. 7, Scutari, or Eskanderié, in North Albania. 8, Ochrida, south east of Scutari. 9, Avlona, in Central Albania. 10, Yanina, or JOANNINA. 11, Delviné, along the southern coast of Albania, opposite Corfu. 12, Trikhala, which embraces the whole of antient Thessaly.

A general description of the whole region is given under TURKEY. For particular accounts of its great divisions, see ALBANIA, MACEDONIA, and THESSALY.

RUMINANTS, *Ruminantia*, Cuvier's name for his eighth order of *Mammifères*, the PECORA of Linnæus.

Cuvier remarks that this is perhaps the most natural and the best defined of the class; for these animals have the air of being nearly all constructed on the same model; and the camels alone present some small exceptions to the common characters. [CAMEL; LLAMA.]

The first of these characters, observes the great French zoologist, is the possession of incisor teeth in the lower jaw only, and these are nearly always eight in number. They are replaced above by a callous rim (bourrelet). Between the incisors and the molars is a wide space, where are found, in one or two genera only, one or two canines. The molars, nearly always six in number on each side of the upper and lower jaws, have their crown marked with two double crescents, the convexity of which is turned inwards in the upper and outwards in the lower teeth.

The four feet are terminated by two toes and two hoofs, which oppose to each other a flattened surface, so that they have the appearance of a single hoof which has been split; whence these quadrupeds have obtained the name of animals with divided or bifurcate hoofs, &c.

Behind the hoof there are sometimes two small processes or spurs, the vestiges of the lateral fingers. The two bones of the metacarpus and the metatarsus are united into a single one, the cannon bone, but in some species there are also vestiges of the lateral metatarsians and metacarpians.

The name *Ruminants* indicates the singular faculty possessed by these animals of masticating a second time their food, which they return into the mouth after a previous deglutition, a power which is the result of the structure of their stomachs, four of which they always have. Of these stomachs the three first are so disposed that the aliment can enter at the will of the animal into any one of the three, because the œsophagus terminates at the point of communication.

The first stomach or paunch (*rumen*, *penula*, *magnus venter*, *ingluvies*—*la panse* of the French) is much the largest in the adult animal, but not so in the recently born calf or lamb. It is divided outwardly into two bag-like appendages at its extremity, and it is slightly separated into four parts on the inside. The internal coat of this stomach is beset with innumerable flattened papillæ. Here are received the masses of herbage rudely broken up by the first mastication, and here it is (though they sometimes, but seldom, occur in the second) that the morbid concretions of a globular or elongated, but rounded, figure are generally found. These concretions are composed of three sorts of substances—of hairs, of the fibrous parts of plants, or of stony matter. The first of these are formed, particularly in the cow, by the animal's own hair, or that of another cow or ox licked off and gradually accumulated in the stomach. Sometimes these are hairy externally, but generally they are covered with a dark polished coat. The *Ægagropilæ* found in the Chamois consist of vegetable macerated fibres. The stony concretions have received the name of *Bezoar stones*. [BEZOARS.]

The herbage in the state above noticed is transmitted [illegible] the second stomach, honey-comb bag, bonnet, or king's-hood (*reticulum*, *ollula*—*bonnet* of the French), the walls of which are furnished with laminæ somewhat resembling [illegible] cells of bees: this, which is small and globular, may be considered as an appendage of the first stomach or paunch, but is distinguished from that by the elegantly arranged polygonal and acute-angled cells, forming superficial cavities on its internal coat. Here the herbage is arrested, [illegible] and compressed into small masses or balls, which are [illegible] returned successively into the mouth for remastication. During this operation, the animals remain in a state of repose,

'Some ruminating lie,'

until all the herbage swallowed has undergone the action of the molar teeth a second time. The aliment thus remasticated is transmitted into the third or smallest stomach, *manyplus* (manyplies)—(*echinus*, *conclave*, *centipellio*, *omasus*, *psalterium*—*feuillet* of the French). This stomach is distinguished from the two former, both by its form, which has been fancied to resemble a hedgehog rolled up (whence the name *echinus*), and its internal structure, the longitudinal laminæ of its walls resembling in some degree [illegible] leaves of a book (whence the name *feuillet*). These numerous and broad duplicatures of its internal coat lie lengthwise and vary in breadth in regular alternate order, amounting to some forty in the sheep, and about a hundred in the cow.

From the third stomach the food is transmitted into the fourth, the *red* (*abomasus*, *faliscus*, *ventriculus intestinalis*—*caillette* of the French), which is next in size to the first stomach or paunch, of an elongated pyriform shape, and with an internal villous coat similar to that of the human stomach, with large longitudinal wrinkles. This last is, so to speak, the true organ of digestion, analogous to the simple stomach of ordinary animals.

We will now proceed to inquire how this complicated machine is connected together, and how it acts.

Blumenbach observes that the three first stomachs are connected with each other, and with a groove-like continuation of the œsophagus, in a very remarkable way. The latter tube enters just where the paunch and the second and third stomachs approach each other; it is then continuous with the groove, which ends in the third stomach [illegible] groove is therefore open to the first stomachs, which lie [illegible] its right and left. But the thick prominent lips which [illegible] the margin of the groove admit of being drawn together so as to form a complete canal which then constitutes a direct continuation of the œsophagus into the third stomach. [illegible] functions of this very singular part will vary according as we consider it in the state of a groove or of a closed canal. In the first case, the grass, &c. is passed, after a very slight degree of mastication, into the paunch as into a reservoir. Thence it goes in small portions into the second stomach, from which, after a further maceration, it is propelled, by a kind of antiperistaltic motion, into the œsophagus, and thus returns into the mouth. It is here ruminated and again wallowed, when the groove is shut. and the morsel of food, fter this second mastication, is thereby conducted directly ito the third stomach. During the short time which it obably stays in this situation between the folds of the in-rnal coat, it is still further prepared for digestion, which ocess is completed in the fourth or true digestive stomach. awrence's Blumenbach.) In notes to the same work it is ated that the shutting of the groove when the food is again allowed after rumination supposes a power of voluntary otion in this part, and indeed, it is added, the influence of e will in the whole affair of rumination is incontestable. is not confined to any particular time, since the animal n delay it according to circumstances when the paunch quite full. It has been expressly stated of some men, no have had the power of ruminating (instances of which e not very rare), that it was quite voluntary with them. have known,' continues Blumenbach, 'two men who ru-inated their vegetable food: both assured me that they d a real enjoyment in doing this, which has also been ob-rved of others; and one of them had the power of doing or leaving it alone according to circumstances.'

Whilst the Ruminants remain at the teat and live upon thing but milk, the fourth stomach is the largest of all. ne first stomach or paunch only develops itself into its ormous volume in proportion as it receives supplies of rbage.

The intestinal canal of these animals is very long, but tle enlarged or sacculated in the great intestines. The ecum is moderately long and smooth.

In the museum of the Royal College of Surgeons the llowing preparations in the physiological series will be und highly illustrative of the function of the machinery ove noticed:—No. 555 consists of the stomach and small stines of a fœtal calf (*Bos Taurus*, Linn.); and No. 556, portions of the four cavities of the stomach of a calf. The scription of these two preparations will be found in the ticle Ox [vol. xvii., p. 75]. No. 557 is the stomach of a at (*Capra Hircus*, Linn.). The greater portions of the *men*, *reticulum*, and *abomasus* have been removed; but e *psalterium* left entire, showing the different characters their inner surfaces, and their several communications ith each other and with the œsophagus. The inner sur-ce of the rumen is beset with elongated villi, spatulate at e extremity; these become shorter as they approach the ticulum, and gradually blend with the alveoli of that vity. The communication of these two cavities is so free to lead to the belief that food, when first swallowed, ses into both cavities. The muscular sphincter bounding e canal which conducts the re-masticated food from the sophagus to the *psalterium* is also clearly shown in this eparation, and the necessary result of its contraction in utting out the *rumen* and *reticulum* from the œsophagus ay be as readily understood. A bristle is placed across the mmencement of the *abomasus*, showing the width of the fice leading from the *psalterium*. No. 558 is a portion the rumen of a sheep (*Ovis Aries*, Linn.). The villi are ttened and dilated towards the extremity. No. 559 and 0 are noticed in the article Ox (*loc. cit.*). No. 561 is a all portion of the *rumen* of a reindeer (*Cervus Tarandus*, nn.), showing the form of the villi, which are longitudi-lly plicated. No. 562 is a small portion of the *rumen* of sheep. A part of the cuticle with which this cavity is ed is turned down; and the stomach has been injected, to ow the vascularity of the subjacent mucous membrane. 563 shows a portion of the *rumen* and *reticulum*, unin-ed, of a sheep, with part of the cuticular lining reflected. 563 A is a portion of the *reticulum* of a reindeer, with cuticular lining partially removed. The cells remarkably llow. No, 564 is a portion of the reticulum of a goat, a the cuticular lining partially reflected. The cells par-y divided into smaller cells. The descriptions of Nos. A and 564 B will be found in the article Ox (*loc. cit.*). 565 is a portion of the reticulum and psalterium, in-cted, of a lamb. The latter cavity has been divided trans-rsely, showing the longitudinal disposition of the laminæ, d how nearly they occupy the whole cavity. Their dif-nt sizes and relative proportions are also well shown by section. Bristles are inserted in the interspaces of the ent laminæ. No. 566 is the remainder of the *psal-* and the *abomasus* of the same stomach. The chief acteristic of the fourth cavity, viz. its vascular villous g membrane, is well shown in this preparation. This is thrown into large oblique rugæ, at what may be termed the cardiac end. The pylorus is protected by a valvular protuberance. In its shape and function this cavity resembles the stomach of carnivorous quadrupeds. No. 566 A is the stomach of a wapiti fawn (*Cervus Canadensis*, Briss.) six days old. At this period the food, consisting of milk only, is conveyed directly to the fourth stomach to be digested: as it requires no preparation in the preceding cavities, they are accordingly collapsed, and of comparatively very small size. The descriptions of Nos. 566 B, 566 C, 566 D, and 566 E, will be found in the article Llama [vol. xiv., pp. 69, 70]; and those of Nos. 567, 568, and 569, in the article Camel [vol. vi., p. 189]. No. 569 A is a portion of the *psalterium* and *abomasus* of a llama, showing the same structure as exists in the camel, but on a somewhat smaller scale. A comparison of this preparation with No. 566 B shows that the laminæ characterising the *psalterium* are not developed in the fœtal stomach of the llama. In the ox, the laminæ of the *psalterium* preserve the same proportions in the fœtal as in the adult state (No. 555). No. 569 B exhibits the pyloric end of the *abomasus* and the commencement of the *duodenum* of a llama. This preparation was made for the purpose of showing the form, position, and structure of the valvular protuberance at the pylorus. It has been divided by a longitudinal incision, and seems principally composed of an accumulation of the sub-mucous cellular texture, the cells of which are large, and, being filled with fluid, must render the part elastic. No glandular follicles are perceptible, nor any conspicuous orifices in the mucous membrane covering the protuberance; yet it has been called glandular. (Home's *Comparative Anatomy*, i., p. 173.) Daubenton however terms it simply 'boursuflure,' without hinting at its use. Its office seems to be merely mechanical: if pressed on by any mass of undigested matter, it would shut up the pylorus, and prevent the passage of such matter into the duodenum; while substances sufficiently comminuted and digested would pass beneath the protuberance, through the semilunar pylorus, into the duodenum. This gut forms at its commencement a capacious reservoir, a small part of which only is preserved in this preparation. No. 723 B is part of the small intestines of a wapiti fawn injected, dried, and put into oil of turpentine. It shows the limited extent of the convolutions of the intestines arising from the shortness of the mesentery, and the mesenteric artery forming in consequence only a single series of arches. No. 735 is a portion of the intestinal canal of a small deer (*Moschus*), showing similar concentric folds of the colon. This disposition occurs in all the Ruminants. (*Cat.*, vol. i.)

Pallas describes and figures, in his 'Spicilegia Zoologica,' the third stomach, with its manyplies, of *Moschus moschiferus*.

The fat of the Ruminants, when cold, after death, becomes harder than that of other animals, and even brittle: it is called tallow and suet (*suif* of the French). The mammæ of this order are situated between the thighs. The general osseous structure may be seen in the articles Bison, Deer, Moschidæ, and Ox. There is a fine series of skeletons of Ruminants in the museum of the College of Surgeons; and among the skulls of oxen, a remarkable pug-nosed variety which is now wild on the pampas of Buenos Ayres.

The fœtus of the Ruminants is developed by the aid of a placenta, divided into numerous detached lobes or cotyledons, the various forms of which are shown in the preparations, numbered from 3481 to 3528 inclusive, in the physiological series of the Hunterian Collection. The camel tribe however here again deviate from the true Ruminants, having no cotyledons, but only a general villous condition of the chorion, as in the mare.

The genera placed by Linnæus under his order Pecora will be found under that head.

Cuvier makes the Ruminants consist of two divisions:—1st, those without horns; 2nd, those with horns.

The 1st division embraces the camels (*Camelus*, Linn.), or the *Camels* properly so called, and the *Llamas;* and the *Chevrotains* (*Moschus*, Linn.). 2nd. All the rest of the Ruminants, of the male sex at least, have two horns or prominences, more or less long, projecting from the frontal bones, which is not found in any other family of mammals.

In some these prominences are covered with a case of elastic substance, composed, as it were, of agglutinated hairs, which grows in layers, and during the whole life of the animal. The name *horn* (*corne*) is particularly applied to the substance of this case, which is termed a *hollow horn*.

The bony prominence or core which this case envelops, grows, like it, during the whole life of the animal, and is never shed. Such are the horns of oxen, sheep, goats, and antelopes. (See the several articles.)

In others the prominences are invested only with a hairy skin, which is continued from that of the head, and is never destroyed during life. These prominences are never shed. Such is the modification of horn possessed by the GIRAFFE, the sole genus of this subdivision.

Finally, in the great genus *Cervus*, Linn. [DEER], the prominences covered during a certain period with a hairy or velvety skin resembling that of the rest of the head, have at their base a ring of bony tubercles, which, as it increases, compresses and obliterates the nutrient vessels of that skin, which, when the horn is complete, dries and is removed. The naked bony prominence separates in due time from the skull, to which it grew, falls, and the animal becomes defenceless. But new horns soon begin to bud, ordinarily, and while the animal is in the vigour of life, larger than the preceding ones, and destined to fall in their turn. These horns, purely osseous and subjected to periodical changes, are termed by the French *bois*, and are known in England by the name of antlers.

Mr. G. R. Gray makes his fifth order consist of the *Ungulata* of Ray (*Bruta*, *Pecora*, and *Belluæ*, Linn.). Of this order, his first family, *Bovidæ*, comprises the whole of the ruminating animals. [OX, vol. xvii., p. 89.]

Col. Hamilton Smith, whose researches and method form the groundwork of most of the treatises on ruminating animals since the appearance of his work,[*] which should be carefully perused by every zoologist, is followed so closely by Mr. Swainson, that the arrangement of the latter is in fact, with slight change of position, the arrangement of the former. Mr. Swainson indeed places the Camels as the ruminating form among the *Solipedes*; but still they stand between the Camelopards and the Horse. He makes the Bovidæ, or Oxen, the typical family; but adopts the names given by the Colonel to that and the other families, with the exception of the *Antelopidæ*, which are equal to the *Capridæ* of Smith; Mr. Swainson making the Antelopes the typical form.

Mr. Swainson's fourth order, *Ungulata*, is divided into the following five tribes: *Pachydermes*, *Anoplotheres*, *Edentates*, and *Solipedes*.

The Ruminantes are thus arranged:—

1. *Sub-typical group.*—Horns sheathing; form gracile, slender.

Fam. Antilopidæ. (Sw.——*Capridæ*, Smith.)

Genera.—*Dicranocerus*, Sm.; *Aigocerus*, Sm.; *Oryx*, Sm.; *Gazella*, Sm.; *Antilope*, Sm.; *Redunca*, Sm.: *Tragulus*, Sm.; *Raphicerus*, Sm.; *Tetracerus*, Leach; *Cephalophus*, Sm.; *Neotragus*, Sm.; *Tragelaphus*, Sm.; *Nemorhædus*, Sm.; *Rupicapra*. *Ant.*, Sm.; *Aplocerus*, Sm.; *Capra*, Auct.; *Ovis*, Auct.; *Damalis*, Sm.; *Acronotus*, Sm.; *Boselaphus*, Sm.; *Strepsicerus*, Sm.: *Portax*, Sm.

2. *Typical.*—Horns sheathing; form heavy, robust.

Fam. *Bovidæ*, Sm.

[OX, vol. xvii., p. 89.]

		Genera and Subgenera.
3 Aberrant. Horns solid, deciduous. *Cervidæ*, Sm., *Cervus*, Linn.		1. *Alce*, Sm. (Subgenera, *Rangifer*, Sm.; *Dama*, Sm.) 2. *Cervus*, Lin., Sw. (Subgenera, *Rusa*, Sm.; *Axis*, Sm.) 3. *Capreolus*, Sm. (Subgenus, *Mazama*, Sm.) 4. *Subulo*, Sm. 5. *Stylocerus*, Sm.
	Horns wanting; forelegs shorter than the hinder. *Moschidæ*, Sw.	1. *Moschus*, Linn.
	Horns very short, covered with a skin. *Camelopardæ*, Sw.	1. *Camelopardalis*, Antiq.

The tribe *Solipedes*, which immediately follows the Camelopards, consists of the genera *Camelus*, *Auchenia*, and *Equus*. Thus the Camels and Llamas, with which Colonel Smith, following Cuvier, commences the Ruminants, are placed by Mr. Swainson at the conclusion. With the exception of this and a few other modifications, the two arrangements are similar.

Mr. Ogilby, in his interesting paper, written with a view of pointing out the characters to which the most importance should be attached in establishing generic distinctions among the *Ruminantia*, read before the Zoological Society, in December, 1836, commenced by observing that it has been justly remarked by Professor Pallas, that if the characters of the *Ruminantia* were to be founded modifications of dentition, in accordance with the [illegible] generally applicable to other groups of [illegible] greater part of the order would necessarily be c[illegible] a single genus; since the number, form, and arr[illegible] of the teeth being the same in all, except the [illegible] Llamas, these organs consequently afford no grou[illegible] definite or general distinctions. Hence, Mr. [illegible] serves, naturalists have resorted to other principles [illegible] regulating the distribution of ruminating animals, and form, curvature, and the direction of the horns, selected [illegible] this purpose at a period when an extremely limited [illegible] ledge of species permitted the practical application of arbitrary and artificial characters without any very violation of natural affinities, still continue to be adopted by zoologists in this department of [illegible] But Illiger, he remarked, forms a solitary but [illegible] exception; for he first introduced the consideration [illegible] muzzle and lachrymal sinus into the definitions [illegible] genera *Antilope*, *Capra*, and *Bos*: his labours however [illegible] disregarded by subsequent writers, or his principles [illegible] applied to the genus *Antilope*. 'It is obvious,' co[illegible] Mr. Ogilby, 'that as the knowledge of new f[illegible] species became more and more extensive, the prevai[illegible] tuitous rule above mentioned, founded as it is upon arbitrary characters which have no necessary relation [illegible] habits and economy, or even to the general external f[illegible] the animals themselves, would eventually involve [illegible] fusion and inconsistency the different groups [illegible] founded upon its application; and such has long [illegible] acknowledged effect. The genus *Antilope* in pa[illegible] has become a kind of zoological refuge for the desti[illegible] forms an incongruous assemblage of all the hollow-[illegible] *Ruminants*, without distinction of form or character. [illegible] the mere shape of the horns excluded from the gen[illegible] *Ovis*, and *Capra*; it has thus come to contain n[illegible] times as many species as all the rest of the hollow-[illegible] *Ruminants* together; so diversified are its forms, and incongruous its materials, that it presents not a [illegible] racter which will either apply to all its species [illegible] to differentiate it from conterminous genera.

'To meet this obvious evil, MM. Lichtenstein, De Blainville, Desmarest, and Hamilton Smith have applied Illiger's principles to subdivide the artificial genus *Antilope* into something more nearly approaching to natural groups; the reform thus effected however was but partial in its operation; the root of the evil still remained untouched, for none of these eminent zoologists appear to have been sufficiently aware of the extremely arbitrary and artificial character of the principal group itself, which they contented themselves with breaking up into subgenera, nor of the actual importance and extensive application of the characters which they employed for that purpose. By mixing up those characters moreover with others of a secondary and less important nature, the benefit which might have been expected from their labours has been in a great measure neutralized; and even the subdivisions which they have introduced into the so-called genus *Antilope* are less definite and comprehensive than they might otherwise have been made.

'The truth is however that the presence or absence [illegible] horns in one or both sexes; the substance and nature of these organs, whether solid or concave, permanent or deciduary; the form of the upper lip, whether thin and attenuated, as in the Goat, or terminating in a broad, heavy, naked muzzle, as in the *Ox*; and the existence of lachrymal sinuses, and interdigital pores, are the characters which really influence the habits and economy of ruminating animals, and upon which, consequently, their generic distinctions mainly depend. These, with the assistance, in a very few instances, of such necessary characters as the [illegible]

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[*] See Griffith's 'Cuvier.'

al and maxillary glands, the number of teats, and
tence of inguinal pores, are sufficient in all cases to
nd characterise the genera with the strictest refer-
logical precision and zoological simplicity.'

ing the discussion of the value of these characters, or
ient of the reasons which induced him to adopt them
rence to those more generally employed in this de-
t of mammalogy, Mr. Ogilby contents himself with
g, 'that the presence or absence of horns in the
regulates, in a great measure, the social intercourse
xes; that upon the form of the lips and muzzle, the
ans of touch and prehension among the *Ruminantia*,
the nature of the food and habitat, making the
grazer or a *browser*, as the case may be; and that
tence or non-existence of interdigital glands, the use
appears to be to lubricate the hoofs, has a very ex-
influence upon the geographical distribution of the
confining them to the rich savannah and the moist
r enabling them to roam over the arid mountain,
hed karoo, and the burning desert.'

gilby then arranges the *Ruminants* under the fol-
families: 1, *Camelidæ* (observing that they form
. MacLeay would call an aberrant group). 2, *Cer-*
omprising the genera *Camelopardalis*, *Tarandus*,
ervus, *Caprea* (type, Roebuck), and *Prox* (type,
). 3, *Moschidæ* [MOSCHIDÆ, vol. xv., p. 430].
dæ [GOAT, vol. xi., pp. 285, 286]. 5, *Bovidæ* [OX,
, p. 89].

is no order of animals that ministers so freely to the
d comforts of man as the Ruminants. They form
t staple of the food and clothing of civilised and
of savage life. Their milk, their flesh, their wool,
ther, their tallow, their horns, in short almost every
of these quadrupeds is made available; and many
are of high utility as beasts of burthen.

FOSSIL RUMINANTS.

nants, Oxen and Deer especially, occur in a fossil
the tertiary series of strata, and most abundantly
ird and fourth divisions of the fresh-water deposits
e period of Lyell). Bones of the Ox have indeed
nd in the second or Miocene system of deposits, as
ensgemünd in Bavaria; but in the Pliocene period
inant remains are to be numerously traced, with ex-
cies of existing genera of *Pachydermata*, viz. Ele-
hinoceros, Hippopotamus, and Horse, together with
nct genus Mastodon. The bone-caverns and the
breccia in the limestone fissures contain them
ly; and they are widely spread over the face of the
A more detailed account will be found under the
articles which treat of the several families and
f this order.

und, in his *View of the Fauna of Brazil*, &c.,
, that of Ruminants there is only one genus in
at of *Cervus*, which contains five species, whereof
he size of the musk, is undescribed. This animal,
es, does not penetrate into the limestone caverns;
their entrances form a spacious chamber, its slot
frequently seen there. Only in Lappa Nova de Ma-
Dr. Lund discover the remains of a single indivi-
hat genus (*Cervus rufus*). He had since observed,
caves that lay near to the habitations of men, the
d skeletons of several domestic animals, especially
goats, the examination of which clearly explained
he cause of their introduction; namely, that those
, whose footsteps he had often traced in the mouth
s, had undoubtedly visited them for the purpose of
the saltpetre, crystals of which cover the surface of
; and that they had lost themselves in the labyrin-
ssages.

overty of genera in the family of Ruminants did not
rise the antient fauna of Brazil; for besides the
rvus, Dr. Lund had discovered two others belonging
eriod. He refers them to two species, of which one
the size of *Cervus simplicornis*, Ili., the other
Cervus campestris. The genus *Antilope* had left
of one species, *Ant. Maquinensis*, as large as a buck,
rt bow-shaped horns curved backwards. It was
us, like its congener, which is now confined to the
ld.

e genus *Camelus* Dr. Lund possesses the remains of
ies; one exceeding a horse in size [MACRAUCHENIA ?],
r a little less. To which of the two subgroups of
us the fossils belong, that is, whether to the modern inhabitant of the warm regions of the Old World, *Camelus* Ill., or to that now found in the chain of the Andes, *Auchenia*, Ill., Dr. Lund's insufficient means of comparison would not allow him to decide.

Dr. Lund concludes his account of the *Ruminants* with a small group that does not exactly coincide with any of its existing genera. This genus, he tells us, which in the lightness of its form rivals the most agile of the Antelope tribe, departs far from that group in the details of its structure, as also from the goat, sheep, ox, and camel. In some isolated points it approaches the genus *Cervus*, while in others it differs from it more than do any ruminants from each other. He proposes the name of *Leptotherium* for this extinct genus, of which he possesses the remains of two species, one less than the roe, the other bigger than the stag.

'If now,' continues Dr. Lund, 'we take a comparative view of the genera and species of this family, in the former and present periods, we must remark, in the first place, the much greater abundance of generic forms that distinguished the ancient creation, inasmuch as their numbers are in the proportion of four to one: of these four, *Leptotherium* is entirely extinct; with regard to the genus *Camelus*, I have already observed that the insufficiency of my means of comparison prevents me from deciding whether the fossil species belong to those of the Old World, or to the sub-group of this continent; but if I might be allowed to venture a speculation on this subject, I should declare for the latter opinion, on the strength of a rule which we shall, in the sequel, see confirmed by many examples, namely, that the animal species of the antient world exceeded in size the corresponding species of the existing races; and we have seen that the fossil species of *Camelus* are considerably inferior to those of the old continent, while they somewhat surpass those of the New World.

'In regard to the genus *Antilope*, it is well known that, in our times, the warmer portions of Africa and Asia constitute its dwelling-place. At the same time I must observe, that one of the latest travellers in Chili, M. Gay, believes that he has recognised a species of Antelope in the descriptions given to him of an animal that inhabits the inaccessible regions of the Andes. Should this supposition prove correct (at which we should not be surprised, when we remember that other animals, more likely to attract man's attention, such as the tapir and the bear, had escaped the observation of naturalists in those very same mountains, until a very recent period), we are then brought back to this remarkable result, that two genera, which are at present restricted to the highest chain of the South American coast, were in the age of our fossil remains extended over its plains.

'The discovery of an animal form, now usually considered as peculiar to the Old World, among the purely American forms, such as the extinct fauna of this quarter has hitherto produced, being a fact of great importance, I thought it right to allude to this novel information, while I reserve myself from giving any positive judgment until further inquiries shall have enabled M. Gay to verify or disprove this report.

'But not only the number of genera, but also the total amount of species was greater in those days than now. There are now five species (all, as before mentioned, belonging to the genus *Cervus*) that inhabit this district, while I already reckon seven species of the four fossil genera. The great number of species which the genus *Cervus* now contains within this region inclines us to suspect that our knowledge of the fossil species is very far from being complete. The circumstance of these animals living solitary, or at most in small herds, together with their rapidity of flight, secures them from the attacks of predatory beasts, much more than animals that either live in large societies, like the *cloven-footed* generally, or which are bad runners, as the *Tardigrada*, and this accounts for our finding their remains so seldom in the caves of wild beasts, in comparison with those of the other classes. Therefore, as the main result of our inquiry respecting this family, we see that of the four genera of which it was composed in that former period, only one still continues to exist in this same district, two must be sought for in the higher chain of the Andes (or perhaps only in the warmer zones of the Old World), and finally, one has entirely disappeared from the surface of the earth.' (*Transatl. Magazine of Nat. Hist.*, New Series, 1840.)

RUMINATION. [RUMINANTS; STOMACH.]

RU'MPHIA, a genus named by Linnæus in honour of George Eberhard Rumph, who was born at Hanau, and went as physician to Amboyna, where he subsequently became chief magistrate and president of the mercantile association, and died there in 1706. He paid great attention to the natural products, especially the plants, of the Spice Islands. Many of these are figured in his 'Herbarium Amboinense,' in 696 plates, each with often two plants, published by Burmann, in six volumes, from 1741 to 1751, with a supplemental one in 1757. The genus which has been named after him is only known from a figure of Rheede, published in his 'Hortus Malabaricus, vol. iv., t. 11, who describes it as being found in Parabaroo and other provinces of Malabar. It has not been seen by any modern botanist. It is usually referred to the natural family of Terebinthaceæ and to the suborder Bursereæ. It has a tubular trifid calyx, three oblong petals of the corol; stamens three, equal to the petals, and exserted. The ovary is single, three-cornered. Style one. Drupe coriaceous, turbinate, three-furrowed, with the nut three-celled, three-seeded. But Messrs. Wight and Arnott remark, that as each apparent stamen may be composed of several filaments, this doubtful genus would be brought near Byttneriaceæ.

RU'MPHIUS. [RUMPHIA.]

RUNCORN. [CHESHIRE.]

RUNIC LETTERS is the name given to an antient alphabet peculiar to the Teutonic nations, especially the Scandinavians and Germans. The time when this alphabet began to be used, is only matter of conjecture, and while some, notwithstanding the statement of Tacitus (*Germ.*, c. 19: 'literarum secreta viri pariter ac fœminæ ignorant'), have advanced the opinion that the Runic characters were used by the Germanic nations long before the commencement of the Christian æra, others suppose that they were an invention of a much later age. The alphabet consisted only of sixteen letters, most of which bear a great similarity to the Greek and Roman characters. This similarity seems to support the opinion of Fr. Schlegel (*Lectures on Antient and Modern Literature*) and others, that the alphabet was originally introduced among the inhabitants of the coasts of the Baltic by Phœnician merchants, and that, with some modifications, it was kept a secret by their priests, and applied to various magic purposes, so that Tacitus would have been perfectly justified in saying that writing was unknown to the Germans.

The earliest Runic characters are found cut on stones, which were either sepulchral monuments or land marks. Such stones are found in Norway, Sweden, Denmark, Northern Germany, and in some parts of France and Spain, in short in almost all countries where nations of the Teutonic race took up their abodes during the fourth and fifth centuries of our æra.

All Runic letters have been divided into three great classes: 1, the Northern or Scandinavian; 2, the German (in the limited sense of the word); and 3, the Anglo-Saxon Runes. Grimm is of opinion that the German Runic characters are only a late modification of the Scandinavian Runes, as the Anglo-Saxon are of the German. In Scandinavia however the Runes seem to have been in use longer than in any other country, and we find that they were written there down to the middle of the fifteenth century, although the common alphabet was known there long before that time. Several Scandinavian MSS. are written in Runic letters, but none of them appear to be older than the thirteenth century, and the most recent were written before the year 1450. The number of stones covered with Runic inscriptions which have been discovered in Sweden and Denmark, is very great. The characters consist almost invariably of straight lines, in the shape of little sticks either singly or put together. Such sticks were in early times used by the Germans for the purpose of ascertaining future events. The sticks were shaken up, and from the figures that they formed a kind of divination was derived. Hence the mysterious character of the Runes (Rûna itself signified secret or mystery), and hence also the word *buchstabe*, the German name for letter, which signifies a stick of a beech-tree. In their zeal for discovering stones with Runic characters, antiquarians have frequently been deceived, and led to consider figures on stones as Runes which were never made by human hands, but were produced by natural circumstances. (Klemm, *Germanische Alterthumskunde*, p. 194, &c.) The word Runes is derived by some from the verb *runen*, to slit or scratch; by others from *raunen*, to whisper.

(For further information the reader may consult Adelung, *Aelteste Geschichte der Deutschen*, p. 373, &c.; Brynjulf, *Periculum Runologicum*, Copenhagen, 1823; Legis, *Fundgruben des alten Nordens*, Leipzig, 1829; Liljegren, *Run-Lära*, Stockholm, 1832, with plates; Schmitthenner, *Kurzes Deutsches Wörterbuch*, under 'Rune;' and more especially W. C. Grimm's work, *Ueber Deutsche Runen*, Göttingen, 1821, 8vo.)

RUNN. [HINDUSTAN, pp. 213, 214.]

RUNNER. [STEM.]

RUNNYMEAD. [JOHN.]

RUPELLA'RIA. [LITHOPHAGIDÆ, vol. xiv., pp. 47, 48.]

RUPERT, PRINCE ROBERT, of Bavaria, better known by the title of Prince Rupert, was born in 1619. His mother, Elizabeth, the eldest daughter of James I. of England, married Frederic V., elector palatine, who was banished and deprived of his estates in consequence of his unsuccessful attempt to seat himself upon the throne of Bohemia. Rupert, an exile from his youth, received little education; his disposition was active; he had a taste for military pursuits, and as the civil wars in England presented an opportunity for employment, he offered his services to Charles I., who put him in command of a regiment of cavalry. He took Cirencester, Hereford, and Lichfield, and was engaged in the battles of Worcester, Edgehill, and Chalgrove Field; but he was remarkable rather for his rash courage and impetuosity than for prudence or military knowledge. He gave strength however to the king's cause: his resolute vigour compensated in part for his want of judgment as a leader, and the king continued to employ him, endeavouring to ensure a continuance of his services by creating him a Knight of the Garter and Duke of Cumberland. He took Bristol, dispersed the parliamentary army at Newark, and was afterwards successful in the north; but at Marston Moor his indiscretion ruined the king's hopes: his want of concert with the marquis of Newcastle and the hasty withdrawal of his troops from the field of battle are gravely censured by Lord Clarendon. Had Prince Rupert 'stayed with the army he marched away with, at any reasonable distance, it would have been long before the jealousies and breaches which were between the English and Scotch armies, would have been enough composed to have agreed upon the renewing the siege.' As it was, in two days after the battle they returned to the posts they had occupied before it took place. (*Hist. Rebel.*, vol. iv., 512.) The king's confidence in him however did not diminish: on the contrary. Rupert, who had been commander only of the horse, was soon after appointed general of all the king's forces, with which he forced Sir Robert Pye to surrender Leicester, after a gallant defence. He gave the first charge in the battle of Naseby, and repulsed the troops with which he was engaged. After the day was lost, he accompanied the king and some remnants of their forces to Hereford, the king hoping to join Gerrard, who had a body of royalist troops in South Wales, and thus to muster a new army. At Hereford, before it was agreed what should be done next, Rupert left the king, and went hastily to Bristol that he might put that city in condition to resist an attack, which there was reason to expect would soon be made upon it. The reverses that the king had lately sustained rendered his continuing in possession of Bristol a point of the most vital consequence. Rupert wrote so confidently of his operations, that the king marched to Chepstow with the intention of joining him. He was dissuaded however; fortunately, as it proved, for after a short defence, Rupert surrendered the city to the parliamentary army. This pusillanimity justly disappointed and irritated the king, who signified his pleasure to the lords of the council that they should require Prince Rupert to deliver his commission into their hands. He likewise wrote the following letter to him, depriving him of his command:—

'Nephew,—Though the loss of Bristol be a great blow to me, yet your surrendering it as you did is of so much [illegible] tion to me, that it makes me not only forget the consideration of that place, but is likewise the greatest trial of constancy that hath yet befallen me; for what is to be done after one that is so near me as you are, both in blood [illegible] friendship, submits himself to so mean an action? (I [illegible] the easiest term) such—— I have so much to say [illegible] say no more of it: only, lest rashness of ju[illegible] to my charge, I must remember you of y[illegible] 12th of August, whereby you assured me that, if [illegible] happened, you would keep Bristol for four months [illegible] you keep it four days? Was there anything like a

stions might be asked; but now, I confess, to little
my conclusion is to desire you to seek your sub-
ntil it shall please God to determine of my condi-
where beyond the seas; to which end I send you
a pass; and I pray God to make you sensible of
nt condition, and give you means to redeem what
ost; for I shall have no greater joy in a victory
t occasion, without blushing, to assure you of my
r loving uncle and most faithful friend, C. R.'
rd, September, 1645.'
ndon. *State Papers;* and Oxford edit. of Claren-
. *Rebell.*)

rendered an account of his conduct before the
elvoir Castle, and removed the imputation of dis-
d treason, but not that of indiscretion. He was
throughout the country, and had the misfortune,
Clarendon, 'to be no better beloved by the king's
he was by the parliament.' He did not resume
y command; nevertheless the king could not long
t him. He sought the appointment of commander
tion of the fleet which still adhered to the king,
ere was no other person to whom the king could
fide the charge, Rupert obtained the post (1648).
ces were immediately required on the Irish
d Ormond and the Royalist party in Ireland
ance, and Rupert, in order to give them aid,
n the harbour of Kinsale. Here Blake, with the
tary squadron, blockaded him, until (October,
esolved to force his way out, which he did, with
two or three ships, and steered for Lisbon. He
ed by Blake, who demanded the surrender of his
e name of the Commonwealth, but the king of
who was in alliance with Charles I., not only pro-
king's fleet, but fitted out a squadron to assist
pert, and so induced Blake to withdraw his fleet.
now sailed to Carthagena, and again Blake pur-
and requested that the prince's ships might be
o him, but the king of Spain, being in amity with
a refusal was given on similar grounds to those
the king of Portugal. From Carthagena he sailed
a, where he was so ill-advised as to sink and capture
lish merchantmen. Informed of this transaction,
nediately followed him, and in January, 1651,
upert's squadron, without reference to the Spanish
, burnt and destroyed all but four or five ships, with
prince escaped to the West Indies, where he sup-
self by capturing English and Spanish merchant-
nce Maurice, who accompanied his brother, was
and Rupert contrived, with two or three ships, to
France, where he sold them, on behalf of Charles
French government.

restoration of Charles II., Rupert left France and
o England, where he was made a privy counsellor,
ed other honours. By this time the impetuosity
uth had diminished, and he judged with more
ion and calmness. When therefore there was a
ment of hostilities with the Dutch, the appoint-
upert to serve under the duke of York was looked
it dissatisfaction. During the expedition he
himself with credit, which was in no way dimi-
en, in the following year, he commanded the
et in conjunction with Lord Albemarle. In 1673
in charged with the command of the fleet,
, actively engaged with the Dutch; but he found
dron so ill-equipped, and, what was worse, so
anned, that he returned home. The king ex-
e coolness at the manner in which he con-
me of his latter engagements. He had now
he active part of his life; he was governor of
Castle, and there spent a great portion of his
pied for the most part with mechanical and
experiments, with painting and engraving; in the
he was an adept, though not the inventor of
, as has often been erroneously stated. [MEZZO-
He died at his house in Spring Gardens, on the
ovember, 1682. His collection of pictures was
his death, and his jewels, which were of con-
value. He had illegitimate children, but was
ried.

was endowed with good natural abilities, had a
ception, was vigorous, active, and energetic; he
ily change employments and pursuits, acquiring
ch a knowledge of that which he undertook as
to prevent miscarriage. He was impetuous, rash, impatient of control and advice, and wanting in most qualities which constitute a great man. His conduct with the king's troops in Yorkshire, at Marston Moor, and at Bristol, and his piracies in the West Indies, have been very justly censured.

(Clarendon, *Hist. Rebel.*; Ludlow's *Memoirs*; Whitelock's *Mem.*; *Mémoires de Grammont*; Campbell's *Lives of the Admirals*; *Biog. Univer.*, &c.)

RU'PICOLA. RUPICOLINÆ. *Rupicola* is also used by M. Fl. de Bellevue to designate a bivalve shell. M. de Blainville divides the *Anatinæ* [PYLORIDIANS, vol. xix., p. 142, 143] into three sections:—

A. Inequivalve species.

Example, *Anatina myalis.*

B. Equivalve, regular species.

Example, *Anatina subrostrata.* [PYLORIDIANS, vol. xix., p. 143.]

C. Equivalve, terebrating species.

Example, *Anatina Rupicola*, Lam. (genus *Rupicola*, Fl. de Belv.).

RUPICOLI'NÆ, a subfamily of Insessorial Birds allied to the *Manakins* and generally arranged under the family *Pipridæ*. Mr. Swainson places both *Calyptomena* and *Rupicola* in the subfamily *Ampelinæ*, or *Typical Chatterers*; and *Rupicola*, in his arrangement, immediately precedes the subfamily *Piprinæ*, *Manakins*, which he considers as subtypical. Mr. G. R. Gray (*Genera of Birds*) places *Rupicola* and *Calyptomena* at the head of the *Ampelinæ*, the fourth subfamily of the *Ampelidæ* in his method.

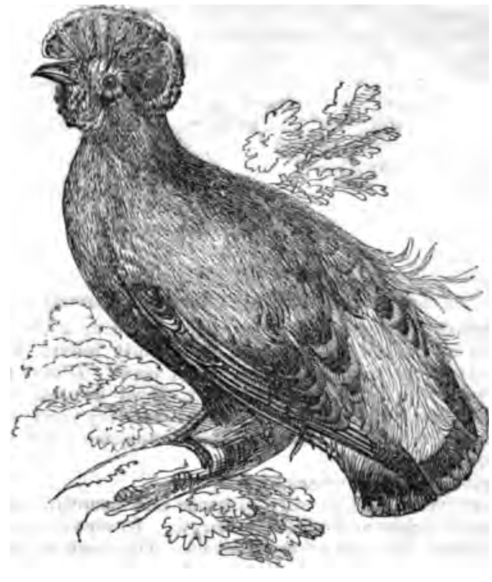
Rupicola, *Briss.* (Cock of the Rock.)

Generic Character.—Bill moderate, robust, rather vaulted and curved at the point, upper mandible as wide as it is high, compressed at the base and notched at the point, lower mandible shorter, straight, and sharp; nostrils oval, lateral and hidden by the feathers of the elevated crest which covers the head. *Feet* large, strong, tarsi partially clothed with feathers, feet syndactyle, outer toe connected with the middle toe beyond the first joint, hallux very strong and armed with a crooked nail. Wings short, rounded; fourth and fifth quills longest.

Geographical Distribution.—Central and South America.

Examples, *Rupicola aurantia*, Vieill., and *Rupicola Peruviana*, Dumont.

Rupicola aurantia.



Rupicola aurantia.

Description.—Male.—Size about that of a Ring Pigeon (*Columba Palumbus*), very bright orange-yellow; a crest, which is compressed and elevated, rises from the head with a helmet-like air, and is varied at the summit with brown and bright yellow; there is some white at the bend and on the middle of the wing, which is filiform at the first quill; the tail-feathers are short, reddish-black bordered with yellow; bill and feet rosy-white.

Female rather smaller, and with a less elevated crest; colour entirely dirty bistre-brown.

This is the *Pipra Rupicola* of Linnæus, *Rupicola Cayana* of Swainson, *Rupicola elegans* of Stephens, and *Rock Manakin* and *Cock of the Rock* of English ornithologists.

Locality.—This beautiful bird inhabits Guiana, especially about the rocks which border the small river Oyapock, and is becoming daily more rare.

Habits, &c.—The Cock of the Rock flies swiftly and is a very shy bird. The nest is made of twigs and dry herbage; and there the female lays two white eggs about the size of those of a pigeon. The food consists of the smaller wild fruits.

Mr. Swainson considers this bird to be the Rasorial type of the true Chatterers.

Rupicola Peruviana.

Description.—Male.—Bright orange, like the preceding, but the quills and tail-feathers are deep-black and the middle wing-coverts are bright grey ash. The crest is of a uniform colour, wanting the deeper coloured semicircular line, and not of a helmet-like contour. The tail-feathers are long.

The Peruvian Cock of the Rock was for some time considered to be a mere variety of *Rupicola aurantia*, but it differs in being of larger size, in colour, in the length of the tail-feathers, in the absence of the filiform wing-feathers, and in the crest, which is not circular as in the preceding species.

This is the *Chiachia lacca* of the Mexicans.

Locality.—Supposed to be the interior of Peru and Mexico: has been brought to Europe from Lima.

Rupicola Peruviana.

Calyptomena, *Raffles*. (*Rupicola*, Temm.)

Generic Character.—Bill depressed and wide at the base, curved or hooked at the point, and nearly hidden by the feathers of the erect and compressed crest. *Wings* large and very broad, first quill shortest, third longest, lesser quills notched at their tips. *Tail* and *feet* very short, hind-toe as long as tarsus, outer and middle toe connected up to the second joint.

Example, *Calyptomena viridis*.

Description.—'This very singular and beautiful bird is about six inches and a half in length. Its colour is a brilliant green like that of the Parrots. The head is rather large, and its feathers are directed forwards from each side, in such a manner as nearly to conceal the bill, giving the face a very peculiar appearance. A little above and before the eyes, the feathers are of a deep velvet-black at their base, and only tipped with green, but crossed on the coverts by three velvet-black bands; the primary feathers, as well as the whole under side of the wings, are dusky, approaching to black, with the exception of the outer margins of some which are edged with green. The tail is short, rounded, composed of ten feathers, which are green above and bluish-black below. The whole of the under parts are green: this colour is lightest on the sides of the neck and round the eyes. The bill is short, wide, much depressed at the base, deeply cleft, and hooked at the p oval, at the base of the bill, and concealed by feathers that project over them. The eyes are the irides bluish. Legs bluish-black; a few feath down over the upper part of the tarsi. Feet outer toe not much shorter than the middle one, it is united as far as the last joint. The female do differ in appearance from the male.' (Raffles.) T the *Burong Tampo Pinang* of the Malays.

Locality.—Singapore and the interior of Sumatra.

Habits, Food, &c.—Sir Stamford Raffles states species is found in the retired parts of forests, an of the colour of the leaves, and perches it procured. He further tells us that the nothing but vegetable substances, chiefly

Dr. Horsfield observes that the bill that of the genera *Rupicola*, *Pipra*, *Phibal* *Platyrhynchus*, and *Procnias*. 'All these Dr. Horsfield, 'have further a natural structure of their feet, which consists toes, particularly of the outer and middle toe, different degrees, but perhaps most strongly in *mena*. The genera above mentioned are a in succession, by the celebrated Temminck, in order of *Insectivores*: it remains therefore sti mined by future inquiries, whether, when more known, they will not be found to constitute a family among the *Passeraux* of Cuvier, connecti family of *Dentirostres* with that of *Syndactyles*.' (*gical Researches in Java*.)

Calyptomena viridis.

RUPPE'LLIA, the name given by M to a genus of Cancerians (*Canceriens* on the *Cancer tenax* of the German veller Rüppell, and considered by M. Edwards as of the small group which leads to the genera *Eriphia*.

Generic Character.—Form of the *Carapace* ing closely to that of *Xantho* and *Ozius*; do slightly curved, and about once and a half as long. *Front* much wider than the buccal occupying, with the orbits inclusive, half of the diameter of the carapace. Latero-anterior border carapace shorter than its latero-posterior borders, with they are continued without forming any remarkable they terminate towards the edge of the genital re are armed with large but not greatly projecting te *orbits* are nearly circular, and are directed up forwards; their lower border is united to the ex gle of the front, so as only to leave at this poin fissure, and not a considerable space, as in other can The result of this disposition is, that the external a are completely excluded from the orbits; their basilary which is large and placed obliquely, reaches, nevert near the external canthus of the eyes; it is soldered front by its superior border, which is very wide, and

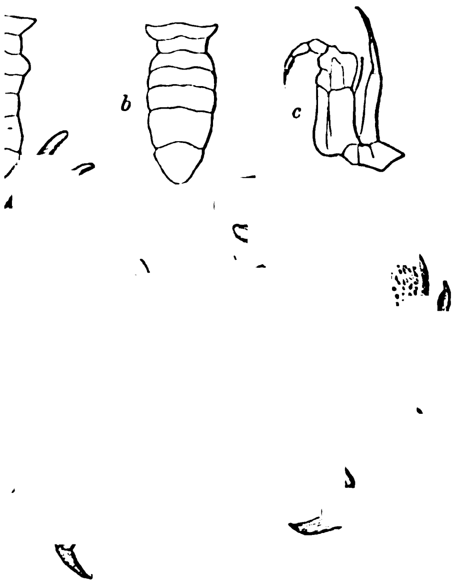
wards its middle, the moveable stem of these ap- which is extremely small. The ***internal antennæ*** directly outwards, as in *Xantho*, &c. The pre- ce is canaliculated, as in *Ozius*, and the third ie jaw-feet leaves, between its anterior border, ery oblique, and the border of the buccal frame, a :h corresponds to the extremity of the efferent ie respiratory apparatus. (M. E.)

e Edwards remarks that, in the rest of their or- , these Cancerians do not much differ from *Xantho* .

e, ***Ruppellia tenax***, *Cancer tenax*, Rüppell.

tion,—Upper border of the orbit marked by two)arated by a small tooth; there is a fissure at its ngle, and two teeth at its lower borders. The embossed and slightly granulous forwards, but d slightly convex backwards. Front armed with d and nearly equidistant teeth: of these the ex- are less projecting than the others, and occupy of the superior border. The latero-anterior the carapace are armed with 4 or 5 flattened teeth, very wide but hardly projecting. The anterior he third joint of the external jaw-feet is notched dle. The anterior feet are stout, and very un- ıe two sexes; the hands are granulous, and the e those of *Carpilius*. Length about two inches.

'.—The Red Sea.



Ruppellia tenax.

bdomen of male; *b*, abdomen of female; *c*, pedipalps.

ıer species, *Ruppelliæ annulipes* and ***venosa*** (lo- nown), are also recorded by M. Milne Edwards, s that *Cancer Calypso* of Herbst ought perhaps red to this genus, which is placed by M. Edwards *'ilumnus* and *Pirimela*.

IA, a genus of plants belonging to the natural ceæ. This genus was named by Linnæus after ppius of Giessen, an active botanist and author of ıensis.' There is only one species belonging to kable genus, and that is a native of Great Britain. *ıritima*, Sea Ruppia, is found in salt-water pools s; it has a slender filiform leafy stem, with linear ich are furnished with sheaths sometimes narrow at other times inflated. Its flowers, which are nber, and green, are seated one above another on des of a short spadix, which is included in a sheath it has large sessile anthers 1-celled: the ovaries ninute grains seated in the centre between the which are sessile and two in number. When the flowered, the spadix lengthens to the height of inches or more, and becomes spirally twisted, as the fruit to the level of the water, in which the always immersed. After this the ovaries begin nd their base is elongated into a footstalk, as the one or two inches long. When the fruit is perfectly ripe, it becomes an ovate acuminated drupe. Sometimes the drupe is more beaked than at others, and the leaf-sheaths are a little dilated, when the plant answers to the description of the *R. rostellata* of Roch and Reichenbach.

RUPPIN, NEW, the capital of a district in the province of Brandenburg and government of Potsdam, in the kingdom of Prussia, is situated in 52° 56′ N. lat. and 12° 55 E. long., on the west side of the great lake of Ruppin, which receives the Klappgrüben, that comes from the Katerbow lake, and flows through the town. By means of the Rhine, the Ruppin canal, and some lakes, it has a communication with the Havel, and so with the Elbe. The town is surrounded by walls, and has five gates. It was nearly destroyed by fire in 1814, but is now a regularly-built and cheerful place: the streets intersect each other at right angles, and there are four handsome squares. Among the public buildings are two churches, two hospitals, a very large building for exercising the troops, the Frederic-William gymnasium, a lunatic asylum, the barracks, the custom-house, and the council-house. There are very considerable manufactories of woollen cloth, flannel, tobacco and snuff, and household furniture; likewise tanneries, breweries, and distilleries. The inhabitants are also partly engaged in agricultural pursuits and in the fisheries, and have some trade. The population is about 8000, besides the garrison, which consists of three battalions of infantry.

(Von Schlieben, *Neuestes Gemälde der Preussischen Monarchie;* Müller, *Geog.-Stat. Topog. Wörterbuch des Preussischen Staates.*)

RUPTURE. [HERNIA.]

RURAL DEAN. [DEAN.]

RUREMONDE (otherwise *Roermonde*) is the capital of a district in the province of Limburg, in the kingdom of the Netherlands. It is situated in 51° 12′ N. lat. and in 6° E. long., on the right bank of the Maas, which flows past the town in a westerly direction, and is here joined by the Roer or Ruhr, which comes from the north. It is surrounded with a rampart and ditch. The inhabitants, about 5000 in number, have woollen and other manufactories, and carry on a considerable trade. This town is tolerably well built, and has a spacious public square. A productive toll on the Maas is levied here. Ruremonde was the birthplace of the geographer Gerard Mercator, who died in 1594. (Hassel; Stein; Cannabich.)

RUSCUS, the name of a genus of plants belonging to the natural order Smilaceæ, known by the common name of Butcher's Broom. The species of this genus are evergreen, and on this account are frequently introduced for undergrowth in shrubberies. The genus is known by its diœcious flowers, of which the barren flowers have a perianth of 6 single leaves, 3-6 anthers with the filaments combined at the base; in the fertile flowers the same perianth with a tubular nectary, single style, fruit superior, 3-celled, cells 2-seeded. One of the species, ***Ruscus aculeatus***, common butcher's broom, is found wild in Britain.

RUSH, the common name of the species of ***Juncus***, a genus of plants belonging to the natural order Juncaceæ. This genus is distinguished by its inferior perianth, composed of 6 glumaceous leaves; its 3-celled 3-valved capsules, the seed-bearing dissepiments of the valves being in their middle. The species are numerous, and are found mostly in moist boggy situations, in the colder parts of the world: several are however inhabitants of tropical regions. The ***Juncus effusus***, the soft rush, and the ***Juncus conglomeratus***, the common rush, are used in many parts of the country for plaiting into mats, chair-bottoms, and for constructing small toy-baskets. The wicks also of the candles known as rush-candles are made from the pith, or, more properly speaking, the soft inner portion of the stem of the same species, which is chiefly composed of cellular tissue.

Rushes of various kinds form frequently very troublesome weeds in agriculture. They grow best on rich land that is wet and cold. They may be destroyed by covering them over with dry materials of various kinds, as ashes, lime, and drift from roads. But the best mode of getting rid of them is to fork them up by the roots in the summer, and after letting them lie for a fortnight or three weeks to dry, to burn them. This however will be found only a temporary mode of getting rid of them, unless the ground on which they grow is well drained.

RUSH, BENJAMIN, was born in the neighbourhood of Philadelphia, in December, 1745. His ancestors had followed William Penn to America in 1683. His father and his grandfather each combined the business of a farm with the occupation of a gunsmith. Losing his father early, he was indebted to the care of an excellent mother for his early education; and he passed five years in the grammar-school of his maternal uncle, the Rev. Dr. Finley, afterwards president of the college of Princeton, to which college Rush was removed at the age of fourteen. Here he became distinguished by his application, his acquirements, and the possession of a fluency of expression for which he was ever after remarkable. At fifteen he obtained the degree of bachelor of arts; and commenced his medical education with Dr. Redman, then an eminent practitioner in Philadelphia. His early attachment to the writings of Hippocrates, as well as his classical acquirements, were evinced, when he was only seventeen, by his translating the aphorisms from the Greek into English, a task which Dr. Hosack, one of his biographers, justly supposes to have influenced the habits of his mind and the character of his subsequent writings. Even at this early period his diligence and method were such, that his notes of the yellow-fever at that time prevalent in Philadelphia contain records of considerable value. At the age of twenty-one he repaired to Europe, and studied two years at Edinburgh, where Monro, Gregory, Cullen, and Black then held chairs. His inaugural dissertation, on taking his degree in 1768, is entitled 'De Coctione Ciborum in Ventriculo,' and contains an account of several experiments made on himself, and some by a fellow-student, to prove the acid changes undergone by the food in the process of digestion. After passing some time in attendance on the London hospitals and lectures, and paying a visit to Paris, Dr. Rush returned to Philadelphia, in the spring of 1769, and commenced the practice of physic, for which he appears to have been eminently qualified not only by the liberal plan of his previous studies, but by his gentleness of disposition and by great humanity. His punctual industry was such, that he is said never to have omitted his duties at the hospital, or those of his private practice, even for a single day, except in the case of illness: and it is added that his love of order was exemplified by his never being ten minutes behind the time when he was expected. He was very soon elected professor of chemistry; and in 1789 he succeeded Dr. Morgan in the chair of the theory and practice of physic. The College of Philadelphia and the University of Pennsylvania becoming united in 1791, he was appointed professor of the institutes of medicine and clinical practice; and from the year 1805 to the end of his life he held the united chairs of the theory and practice of medicine and of clinical practice. His popularity as a lecturer was evinced by the number and the attachment of his pupils, and the celebrity which his reputation mainly imparted to the medical school of Philadelphia. At a late period of his life he still warmly expressed the pleasure he had derived from 'studying, teaching, and practising medicine.' But the times in which he lived were too full of events to permit him to pay that undivided attention to medical science which he subsequently regretted had ever been impeded by public events. In the Congress of 1776 he held a seat as a representative of the state of Pennsylvania; and he subscribed the declaration of independence. He was appointed physician-general of the military hospital of the middle department in 1777; and chosen a member of the state convention for the adoption of the federal constitution ten years afterwards. A few years later, in 1794, he describes himself as having 'lately become a mere spectator of all public events;' from which period he seems to have devoted himself almost exclusively to medical studies and pursuits: he held however the office of treasurer of the United States Mint during the last fourteen years of his life. On different occasions he received medals from the king of Prussia and the queen of Etruria, for information communicated to them in answer to inquiries concerning the yellow-fever; and in 1811 the emperor of Russia sent him a diamond ring as a testimony of respect for his medical character. His useful life was terminated, after a short illness, on the 19th of April, 1813.

The character of Dr. Rush exhibits a combination of nearly every quality appropriate to a physician; industry, temperance, benevolence, uprightness, public independence, piety, were in him united with learning and general knowledge, and a profound acquaintance with almost every branch of medical science. By habits of early rising, and a wise economy of time, he was enabled, in the midst of arduous and continual duties, to treasure up and to con
a variety of observations peculiarly stamped wit
and all his exertions were animated by a phi
which caused him to devote one-seventh of his
purposes of charity, and dictated his memorable in
junction to his son, 'Be indulgent to the poor.' In the
1793, when Philadelphia was ravaged to an unex
tent by the yellow-fever, his services were so much
quest that his exertions nearly cost him his life.
was filled at all hours with applicants for relief, and
riage beset in the streets.

The life of physicians actively engaged in the stud
practice of their profession seldom offers much of
interest. Dr. Rush's life may be said to have been
to mankind; and his history is that of his public
professional toils, and his writings. He mar
Miss Julia Stockton, daughter of Judge Sto
described as a lady of amiable disposition and
mind. Dr. Rush was survived by nine of thir
the fruits of this marriage.

The number of Dr. Rush's works is conside
include a history of the yellow-fever as it appear
delphia in 1793, and of other epidemics of differ
One of his latest works was a 'Treatise upon the
of the Mind.' His last was a letter to Dr. Hosack on
ject of hydrophobia, which terrible disease he co
to be principally seated in the blood-vessels. In
published an 'Inquiry into the Effects of Public
ments upon Criminals and upon Society,' to which
gation of the Pennsylvanian code is attributed.
edited the works of Sydenham, Cleghorn, Pringle,
Hillary.

The principal papers published at various times
Rush are collected and comprised in two volumes of
dical Inquiries and Observations.' The first of these
published at Philadelphia in 1788; the second in 1793.
these volumes, four editions appear to have been publi
in four years. Their contents consist of about thirty
essays, all on subjects of medical interest; each
guished by the philosophical character of the author,
not a few interesting to general readers, to morali
statesmen. The essays 'On the State of Medicin
the Indians;' 'On the Influence of the Military and
cal Events of the American Revolution upon the H
Body;' 'On the Influence of Physical Can
Moral Faculty;' and 'On the State of the
in Old Age,' are strongly indicative of the obser
fleeting habits of the author. The account of
Pennsylvania presents a model of medical topography,
ject at that time little cultivated. Several of the essays
separate diseases, as the Scarlatina Anginosa, the Cholera
Infants, the Influenza, &c., are distinguished by accura
of remark and a well exercised judgment. The essay
the Effects of Spirituous Liquors on the Human B
contains the strongest original arguments that could be
ployed by the most zealous advocate of temperance; and
the 'Inquiry concerning the Causes and Cure of Cons
tion' we recognise the doctrine of the general or
stitutional origin of that fatal disorder, subsequ
supported by Dr. Beddoes, but more recently and
distinctly and ably illustrated by Sir James
The celebrated doctrine so often and so eloquently
pounded by the late Mr. Abernethy, of the 'Constitu
Origin of many Local Diseases,' is very perspicuous
nounced in Dr. Rush's 'Inquiry into the Causes and
of Sore Legs.' There are indeed few volumes in
literature which will better repay the perusal of the
than those of Dr. Rush. Large and enl tened
the causes of disease, minute observations
and sagacious principles of cure, are contai
writings of this distinguished physician, co
dications of his having possessed all the vir
animate and adorn the profession to which he

(Thomson's *Annals of Philosophy*, vol. i.;
Americana, vol. ii.; *Diss. Phys. Inaug.*, *De*
rum, &c., Edin., 1768; *Amer. Med. and Phil*
vol. iv.; Chalmers, *Biog. Dict.*, vol. xxvi.; *Dic*
ences Médicales: Biog. Med., vol. vii.)

RUSH-BEARING, another name in
England for the country wake. It appears
times the parishioners brought rushes at the Fe
cation, wherewith to strew the church, and
cumstance the festivity itself obtained the

The country wake occurs by this name in the of the Lancashire dialect, and Rush-bearing is still common name in many villages in Lancashire for this ual festivity. In the parish accompts of St. Margaret's, ainster, is this item, under the year 1544:—'Paid for against the Dedication Day, which is always the first unday of October, 1*s*. 5*d*.' Notices of the custom of Rush-aring, as still used in various parts of Derbyshire, will be und in Glover's 'History and Gazetteer' of that county, i., pp. 259, 260. (Brand's *Popular Antiq.*, vol. i., p. 436; s's *Glossary*.)

JSHES are well-known plants which appear in all especially those which are fertile, when the water hich cannot be evaporated remains in a stagnant state nder the surface. They are most common on moist mea-s with a retentive subsoil; and as they not only occupy ce which might produce good herbage, but also greatly orate the hay with which they are mixed, every means troy them are employed by industrious farmers. For-y in this, as in most other instances of defect in the soil, a temporary remedy was generally thought of. The rushes wn down at particular times of the year, alkaline ashes were spread over them, and, in some cases, they were oyed by pouring boiling water on the roots. But all these killed the individual rushes, without removing the diate cause of them, or correcting the stagnation of which invariably reproduced them. The only effec cure for rushy grounds is a complete system of drain- The truth of this assertion is so generally admitted, it is unnecessary to dwell upon it. Wherever the land be effectually under-drained, rushes will generally disap-r as by magic. If they are strongly established in the soil, y take some time before they completely die away, even lrainage, at least in pastures which are not broken up; the land is ploughed and has a proper tillage, they not survive the first year. In rich old meadows, which ould not be prudent to plough up, they may be destroyed mowing them when they are in bloom, and immediately ashes or salt over the place where they grew. This twice will clear the ground entirely, and the drain-ill prevent their reappearing.

heavy grounds which have been laid up in high stitches t thoroughly draining the land, and sown with eeds to remain in pasture two or three years, it uncommon to see every interval between the filled with rushes, especially if the land be re-l in fertility by overcropping. This indicates a wet l, and suggests under-draining; but the rushes are caused by the very roundness of the stitches, which upposed to keep the land dry, but which accumulates ater in the furrows. If the land had been laid quite it might have been too wet to produce good crops of but rushes would not have appeared. In very flat ows rushes are only found where the land lies very with an impervious subsoil, or a want of inclination in e to carry off the superfluous water. What might ight be considered as an anomaly, is yet perfectly rushes are found in the best water meadows, h they are for a considerable portion of the year en-aked in water; but the water is never allowed to te for a moment, and is always kept running on and

great advantage which has been obtained by the of thoroughly draining compact soils, or those which impervious subsoils, has induced proprietors and of land to employ their capital in this most certain provements, and the consequence will be, that in years the question as to the mode of destroying will no longer be heard; and they will only be seen low and unprofitable spots from which the water be drawn off by drains, and where they will supply ll resource to the maker of mats and the repairer ottomed chairs.

IWORTH, JOHN, is said by Anthony Wood een born in Northumberland about 1607, of a good and to have studied for a short time at Oxford, however he did not remain long enough to be matri-d. Coming up to London, he entered himself of Lin-Inn, and was called to the bar; but it does not appear be ever practised. So early at least as the year 1630, he according to his own account (in the preface to the olume of his *Historical Collections*) to attend in the Chamber, the Court of Honour, the Exchequer chamber, the council, and other places, whenever any matter of importance was in question, and to take notes of the proceedings; and in this way his time seems to have been wholly occupied. When the first parliament of 1640 assembled, he eagerly embraced the opportunity of being present at the debates and conferences of the two houses; and after its dissolution he proceeded to the north, the scene of the Scottish invasion, where he witnessed the fight of Newburn, and afterwards found admission to the meetings of the great council at York and of the commissioners at Rippon. When the Long Parliament met, in November, Rushworth was appointed assistant to Henry Elsynge, Esq., clerk to the house of commons; and by the opportunities which he enjoyed in this situation, he was enabled to make ample collections relating to all the most interesting public transactions of the time. It appears to have been his practice to take down in a species of short-hand whatever was said in the house which he thought worth preserving. Thus, he tells us himself, that on the evening of the day on which the king made his attempt to seize the five members, 'his majesty sent for Mr. Rushworth, the clerk, whom he observed to take his speech in characters, requiring a copy of it; who pleading in excuse how Mr. Neville was committed to the Tower for telling his majesty what was spoken in the house, he smartly replied, "I ask you not to tell me what was said by any member, but what I said myself;" upon which a copy being transcribed, it came out in print next morning, by the king's order.'

But besides his services as clerk and reporter, after the king had left London, Rushworth (being, it would appear, a good horseman) was the person usually employed to carry addresses and other communications from the house to his majesty; and Wood records that on those occasions he was wont to perform the journey to York in twenty-four hours. At a somewhat later date he appears to have been in like manner entrusted to convey the messages of the house to their general, Essex. On the 14th of June, 1643, the house ordered 'That the mare and young horse belonging to Mr. Endymion Porter, lately brought up from Enfield to London, be forthwith delivered to Mr. John Rushworth, to be employed in the service of the parliament in sending messages between this house and the Lord-General.' On a subsequent day it was further resolved that he should be recommended to the committee of the house for excise, and to the treasurers and commissioners, to be employed in some office or place suitable to his condition and the recommendation of the house, 'towards a recompense of the several services he hath done for the kingdom.' It is not known however that he derived any substantial benefit from this vote.

In 1643 he took the covenant with most of his party. In 1645, when the command of the parliamentary forces was given to Sir Thomas Fairfax, who was his near relation, Rushworth was appointed his secretary; and from this time he was principally with the army, till Fairfax's resignation of his command in 1650. Being at Oxford in Fairfax's suite in 1649, he received from the university the degree of M.A. Having returned to London and taken up his residence in Lincoln's Inn, he was, in 1652, appointed one of the committee for the reform of the common law. The next time we hear of him is as one of the members for Berwick in Cromwell's last parliament, which met in January, 1658; and he again sat for the same borough in that which restored Charles II., in April, 1660. The overthrow of the Protectorate however was fatal to Rushworth's rising fortunes. We have seen the zeal with which he served the republican party; and there can be no doubt that this was the side to which he was heart and soul attached; he had submitted the first volume of his 'Historical Collections,' in manuscript, to Oliver Cromwell; and when it appeared in print it was ushered in by a dedication in very high-flown terms to the new Protector Richard. When the king came back, Rushworth withdrew this unlucky dedication; and he also made a modest attempt to conciliate Charles by presenting to him some registers of the Privy Council which had fallen into his hands. Thanks were formally returned to him in the king's name for the books, but he received no encouragement to expect any further evidence of the royal favour.

Rushworth had not, like many of his party, taken advantage of his opportunities and of the appointments he had held, to secure a fortune to himself out of the misfortunes of his country, and he was now probably in rather straightened circumstances. When Sir Orlando Bridgeman was made lord keeper however, in 1677, he appointed Rushworth his secretary; and we find him sitting again for Berwick, both in the parliament which met in March, 1679, and also in that which met at Oxford in 1681. But after this, it is stated, he lived in retirement and obscurity; till, in 1684, he was arrested for debt and sent to the King's Bench prison, where he remained till he died, on the 12th of May, 1690. He had latterly taken to drinking to drown care, and his mind and memory were nearly gone for some time before he died.

Rushworth left several daughters, 'virtuous women,' says Anthony Wood, 'of which one was married to Sir Franc. Vane, of the North.'

The first part, in one volume folio, of Rushworth's 'Historical Collections of Private Passages of State, Weighty Matters in Law, and Remarkable Proceedings in Parliament,' embraces the space from 1618 to 1629, and was published in 1659. It was reprinted clandestinely in 1675, and also again in 1682. Part second, in two volumes, extending from 1629 to 1640, appeared in 1680; and that same year Rushworth also published, in one volume folio, his account of the Trial of the Earl of Strafford, which is now considered as forming the eighth volume of his 'Historical Collections.' The remaining parts of that work were left ready for the press at his death; and part third, in two volumes, extending from 1640 to 1645, appeared in 1692; part fourth, also in two volumes, and coming down to 1648, in 1701. All the seven volumes, together with Strafford's Trial, were reprinted in 1721. Rushworth's intention, as he states in the preface to his second volume, had been to bring down the work to the dissolution of the Long Parliament in 1653.

Of the importance of this active and industrious compiler's labours, and of the value of what he has bequeathed to us, there can be no doubt. His collection contains an immense number of papers and notices now nowhere else to be found, and many which never were to be found elsewhere. And it may also be admitted that the promise of perfect impartiality with which he sets out, is upon the whole as well kept as we have any right to expect that it should be. The book however was loudly cried out against for its unfairness, its positive falsehoods and inventions, as well as its omissions and suppressions, by the high church and Tory party on the appearance of the first volume. An elaborate exposition of the grounds of these charges (which however are very unsatisfactorily made out after all) may be found in the long introduction to Nalson's 'Impartial Collection of the Great Affairs of State from the beginning of the Scotch Rebellion in the year 1639;' which indeed was professedly published 'by his majesty's special command,' in opposition to Rushworth's work, but of which, although it was intended to come down to the death of Charles I., no more than two volumes ever appeared, the first in 1682, the second in 1683, carrying the history no farther than to January, 1642.

RUSSELL, LORD WILLIAM, was born in September, 1639: his ancestors were early possessed of landed property in Dorsetshire. We find John Russell in 1221 the constable of Corfe Castle, and his descendants subsequently filling honorable situations: one of them, Sir John Russell, was Speaker of the House of Commons in the second and tenth year of Henry VI. A fortunate occurrence raised this family to wealth and honour: in 1506 Philip, archduke of Austria, having been driven by a storm into the port of Weymouth, was hospitably entertained by Sir Thomas Trenchard, a neighbouring country gentleman and Sir Thomas, knowing that the then head of the Russell family had travelled and was a good linguist, invited him to meet his unexpected guest. During this visit Mr. Russell so pleased the archduke that he recommended him to the king, by whom he was appointed one of the gentlemen of the Privy Chamber. 'He afterwards attended Henry VIII. in his expedition in France, and was present at the taking of Therouenne and Tournay. In 1522 he was knighted by the earl of Surrey for his services at the taking of Morlaix in Bretagne, and was created Lord Russell in 1539.' The lands of the abbey at Tavistock and of the dissolved monastery at Woburn were afterwards conferred upon him, and he was made earl of Bedford. (*Life of Lord Russell*, by his descendant Lord John Russell, from whose work the principal part of this article is derived.)

He died in 1555, and was succeeded by Francis, the second earl, who left no issue. The title now passed to the only son of Sir William Russell, by name Francis, who is known among other things for his drainage of the fens of Lincolnshire by the Bedford level. He died in 1641, and was succeeded by William Russell, who married Lady Anne Carr, daughter of the countess of Somerset, known for her participation in Sir Thomas Overbury's murder, and had issue, three daughters and seven sons, of whom Lord Russell, the subject of this memoir, was the third. The eldest died an infant, and the second in 1678.

Russell was educated at Cambridge, afterwards resided at Augsburg, spent a considerable time in different parts of the Continent, returned to England at the Restoration, and was elected member for Tavistock. He married, in 1669, Rachel Wriothesly, second daughter of the earl of Southampton, and widow of Lord Vaughan, the eldest son of Lord Carberry, a woman distinguished for ardent and tender affection, pious, reflecting, firm, and courageous; alike exemplary in prosperity and adversity, when observed by multitudes or hidden in retirement.

In the company of his excellent wife Russell would have continued to enjoy without interruption all the happiness of a private life, had the government been conducted security and honour. But his indignation and fears b awakened by the hypocrisy and shameless Charles II., and the avowed desire of the Duke restore the Roman Catholic religion, he entered the political contention, ranging himself with the de Protestantism and the opponents of the king's de gave great strength to the popular cause; 'I nev says Burnet, 'any man have so entire credit with as he had. He quickly got out of some of the into which the court had drawn him, and ever life was unblemished in all respects. He had in education an inclination to favour the nonconfo wished the laws could have been made easier they more pliant to the law. He was a slow man little discourse; but he had a true judgment when sidered things at his own leisure. His understanding not defective, but his virtues were so eminent that would have more than balanced real defects if any had found in the other.' Lord Cavendish, Sir W. Co Colonel Birch, Mr. Powle, and Mr. Littleton were the cipal members of the party with which he acted, and by proceeding at first with moderation, gained so an influence in the country. that the king sudd rogued the parliament, and when it re-assemble his opponents so strong that it was hopeless to the continuance of the Dutch war. Thus the ance with France was dissolved, and the troops by Charles had wished to make himself absolute w persed; the Cabal ministry was broken up, and B ham and Shaftesbury were converted into popular The king's intrigues with France were speedily re and engagements entered into, for the performance of he was again to receive a stipulated sum of money. intrigues were further opposed by Russell; the co party recommended war with France, promoted the peachment of the king's minister and favourite Lord Da and voted the exclusion of the Duke of York fr cession to the throne. These were violent measures, were justified by the condition of the country, the baseness, and the fear of despotism and the re ment of the Roman Catholic religion. The struggle a second civil war, and had Charles, like his successor, tacked the church as directly as he did the constitution immediate civil war would have been the probable as it was, the foundation of a future revolution was

Some of the principal Whigs were accused of having spired to take the king's life, to raise a rebellion in country, and to establish the Duke of Monmouth, the illegitimate son, upon the throne. This was call 'Rye-house Plot,' from the name of a farm near market, at which it was said that the conspirators meet, in order to attack and dispose of the king turned from Newmarket races. There had doubtless many meetings of disaffected persons. 'Of this plot,' Mr. Fox (Introductory chapter to *Hist. of James II.*), 'i be said, much more truly than the Popish, that there it some truth mixed with much falsehood; and th many circumstances in Kealing's (one of the info count are nearly as absurd and ridiculous as those it seems probable that there was among some of those accused a notion of assassinating the king; but w

s ever ripened into what may be called a design,
more whether it was ever evinced by such an
as the law requires for conviction, is very doubtful.
to the conspirators of higher ranks, from whom all
of participation has been long since done away,
nquestionably reason to believe that they had often
onsulted, as well for the purpose of ascertaining
s they actually possessed, as for that of devising
r delivering their country from the dreadful ser-
to which it had fallen; and thus far their conduct
learly to have been laudable.' The court ascribed
safety to his return from Newmarket somewhat
an was expected, and prepared to take advantage
ening which now offered for the annihilation of
tical adversaries. Russell, Essex, Sidney, and a
f less important persons were immediately com-
the Tower. Some were convicted and executed
ssell was brought to the bar. On the 13th of
3, he took his trial at the Old Bailey for high trea-
was indicted 'for conspiring the death of the king,
ulting and agreeing to stir up insurrection; and
nd to seize the guards for the preservation of the
rson.' A full account of the proceedings is given
ohn Russell (*Life*, p. 184), and in Phillips's *State*
We believe that the extent of his error was having
a meeting where a general rising was spoken of,
there was some discourse of the feasibleness of
e king's guard. It was not shown that he consented
f these schemes, which were never matured or
d on. An illegal construction was put on the
dward III., the statute under which he was in-
The evidence against him was contradictory and
it; no one charge in the indictment was proved:
nomination of the panel, the sheriffs, who were
of the court, had secured his conviction. He was
lty and sentenced to death.

he time that the sentence was passed till the day
ecution, he manifested great piety, and main-
dignified calmness. He was accompanied to the
y Bishop Burnet and Dean Tillotson. Burnet,
ise attended him during his imprisonment, has
account of his latter days. He delivered to the
t the time that he was beheaded in Lincoln's Inn
the 21st of July, 1683, a paper containing an expla-
statement of his conduct. Speaking of those who
is plot, Mr. Fox says, 'that which is most certain in
is, that they had committed no overt act indicating
ning the king's death, even according to the most
onstruction of the statute of Edward III., much
ny such act legally proved against them; and the
to levy war was not treason, except by a recent
harles II., the prosecutions upon which were
limited to a certain time, which in these cases
d; so that it is impossible not to assent to the
those who have ever stigmatised the condemna-
xecution of Russell as a most flagrant violation of
stice.' The firm and noble conduct of Lady Rus-
attended her husband during his trial to take
give him assistance, deserves the greatest admira-
e bitterness of their parting is described in the
etic terms, and a lasting grief is shown in her
t correspondence. She died at Southampton
Sept. 1723, at the advanced age of eighty-six.

e not mentioned the charge made against Lord
common with Algernon Sidney, and many others
pute, of having received bribes from the French
nt. We believe it to be groundless, as far as the
ns mentioned are concerned, but we must refer
would inquire into the subject to the more
d biographies. Lord Russell's character is wholly
e with such an act. As a politician, he appears
disinterested; he was zealous and energetic,
t conspicuous for ability, the high public estimation
e was held being founded upon his sense, his judg-
his integrity. To a severity of public principle
the mildness of domestic affection; he was be-
is wife and children with sincerity and earnest-
rd Russell's son was created duke of Bedford, one
ghters was married to the duke of Devonshire,
er to the duke of Rutland. An act for annulling
ler, which passed in the first year of William and
ites that 'he was by undue and illegal return of
ving been refused his lawful challenge to the said
C., No. 1260.
jurors for want of freehold, and, by partial and unjust constructions of law, wrongfully convicted, attainted, and executed for high treason.' After the executions which followed the Rye-house Plot, the country party had little influence during the remainder of Charles's reign.

(Lord John Russell's *Life of Lord Russell*, from which this article is compiled; *Life and Letters of Rachel, Lady Russell;* Burnet's *Own Times;* Hallam's *Const. Hist.;* Fox's *Life of James II.;* Hume; *Biog. Univer.*, &c.)

RUSSELL, ALEXANDER, was a native of Edinburgh, where he received his medical education. Having finished his studies in the university of that city, he came to London, and in the year 1740 was appointed physician to the English factory at Aleppo. Having made himself master of the Arabic language, he soon obtained a pre-eminence over all the practitioners in the place, and was honoured by the particular friendship of the pasha. On his return to England, in 1754, he published his 'Natural History of Aleppo,' a valuable and interesting work. It contains a description of the city and principal natural productions in its neighbourhood; together with an account of the climate, inhabitants, and diseases, and a diary of the progress of the plague in 1742-3-4. Four years after the publication of this work a vacancy occurring in St. Thomas's Hospital, he was elected physician to that institution, which office he retained till his death in 1768.

He was a man of great abilities, industry, and humanity. He presented several contributions to the Royal and Medical Societies. A second edition of his 'Natural History of Aleppo,' revised, enlarged, and illustrated with notes, by Patrick Russell, has been translated into several European languages.

RUSSELL, PATRICK, brother of Dr. Alexander Russell, was born in Scotland, in the year 1726. His father was a lawyer of great eminence in the city of Edinburgh, and of seven sons whom he brought up, it is reported that not one ever gave him a moment's disquietude. We possess no record of the early history of the subject of the present memoir. It appears however that he completed his medical studies in the University of Edinburgh, and some time afterwards we find him at Aleppo, residing with his brother Dr. Alexander Russell. On the return of the last-named physician to England, Dr. Patrick Russell succeeded him as physician to the British factory at Aleppo. It was during his residence in this capital that the great plague of 1760 and the two following years broke out in Syria, and the opportunities which it afforded him of studying this disease in all its varieties, were not thrown away on a man of his abilities. His quarto work on the plague, which was published some years after his return to England, is justly esteemed one of the best and most complete that ever has been written on the subject. It contains an historical and medical account of the disease, and treats fully the subjects of quarantine, lazarettos, and the police to be adopted in times of pestilence. He also gave to the public a new and very enlarged edition of his brother's work on Aleppo; and in 1796 published an account of the Indian serpents collected on the coast of Coromandel, containing descriptions and drawings of each species, together with experiments and remarks on their several poisons. He died in the year 1805, and his name will be found among the contributors to the Royal Society and some others.

RUSSIAN EMPIRE, THE, extends over the north-eastern part of Europe, over the whole of Northern Asia, and the north-western coast of North America. It consists of Russia in Europe; GEORGIA, or Caucasia, SIBERIA, and KAMTCHATKA in Asia; and some settlements on the north-west coast of North America. [NORTH-WEST TERRITORY.] Excluding the last-mentioned country, the area of the whole empire, according to a very rough estimate, is 7,700,000 square miles, of which 2,110,000 belong to Europe, nearly 5,400,000 are included in Siberia, about 100,000 in Georgia, and 86,000 in the peninsula of Kamtchatka.

EUROPEAN RUSSIA comprehends the north-eastern portion of that continent, extending from 43° to 71° N. lat. and from 20° to 63° E. long. It is divided from Asia by the Ural Mountains, which begin on the peninsula which lies opposite the island of Nova Zembla, east of the Strait of Waigatz, and extend in a southern direction to 54° N. lat., where they divide into three ranges. [URAL MOUNTAINS.] From this point, the river Ural, which rises between the two most eastern ranges, is considered to form the boundary-line until it falls into the Caspian Sea. It is however to be observed that the political division of Russia does not in its whole extent coincide with this boundary which has been adopted by geographers, and that a portion of the two governments of Perm and Orenburg extend to the east of this line, and may therefore be considered as lying in Asia. From the mouth of the river Ural the boundary runs along the north-western shore of the Caspian Sea to the embouchure of the river Kooma. At this point begins the southern boundary-line, which runs along the course of that river to 45° E. long., and then nearly north to the river Manytch, whose course it follows to 41° 30′ E. long., whence it continues nearly due west to the Sea of Azof, and chiefly along the course of the river Ieia. By this line Caucasia, or the two governments of Caucasus and Grusia or Georgia, are separated from Russia in Europe. The remainder of the southern boundary is formed by the Sea of Azof, the Straits of Yenikalé, and the Black Sea. Near its western boundary Russia extends to the banks of the Danube, which forms the boundary between it and Turkey as far as the mouth of the river Pruth (near 28° E. long.). The Pruth divides Russia and Turkey nearly to its source in the Carpathian Mountains. Russia then begins to border on the kingdom of Galicia, a portion of the Austrian empire, from which it is not separated by any natural boundary. Where it touches the kingdom of Poland, which at present is to be considered as an appendage of Russia, the rivers Bug and Niemen constitute the boundary-line, but between them there is a tract in which the boundary is indicated partly by the river Narew, an affluent of the Vistula, and partly by an imaginary line. North of the river Niemen, Russia borders on Prussia, from which it is separated by an imaginary line. Farther north it comes up to the Baltic, surrounding the Gulfs of Riga and Finland, and stretching along that of Bothnia to its northern extremity (66° N. lat.). Farther north it borders on Sweden and Norway. It is separated from Sweden by the lower course of the river Tornea, and farther north by its affluent the Muonio. The boundary between Russia and Norway is partly formed by the watershed between the Gulf of Bothnia, and partly by the course of the river Tana. A small part of Norway extends east of the river Tana. On the north, Russia is washed by the Arctic Ocean, which here forms the extensive gulf called the White Sea. The countries included within this boundary-line, according to a very rough estimate, occupy an area of 2,110,000 square miles.

Surface.—The whole surface of Russia may with propriety be considered one extensive plain. If the Ural Mountains, which extend along its eastern border, and a mountain tract in the peninsula of the Crimea [CRIMEA] are excepted, there is not in this immense extent of country an eminence which rises more than 500 feet above it base, or more than 1100 feet above the sea-level. The watershed which divides the rivers that flow to the Arctic Ocean, the Baltic, the Black Sea, and the Caspian Sea, is not formed, as in Western Europe, by mountains, but by tracts of elevated ground, the summits of which extend in wide and nearly level plains, and whose declivities form long and generally imperceptible slopes. The plains themselves are covered either with bogs and swamps or with forests, and in other parts they are dry and woodless tracts called *steppes*.

In tracing this watershed, we begin on the west. Almost on the banks of the river Bug, which separates Poland from Russia, between 51° 30′ and 53° N. lat. there is a plain which is flat, and the rivers and watercourses have so little fall as to render them unfit to carry off the accumulated water. The whole plain therefore is nearly a continuous swamp, covered with trees, especially firs. It contains the sources of several affluents of the Dnieper and Vistula. On both sides of 52° N lat. it extends from 24° to 30° E. long., a distance of 210 miles, and renders the country on both sides of the river Pripec almost impassable. This portion of the watershed is called the Swamps of Pinsk and Ratnor. The swampy ground extends farther north, between the affluents of the Niemen and Dnieper, to 55° 30′ N. lat., and terminates on the banks of the Düna between Polotsk and Droova. In these parts however the swamps are only from 100 to 50 miles in width, and are frequently interrupted by tracts of drier and more elevated land. On the east of the northern extremity of these swamps, between 54° 30′ and 55° 30′ N. lat., there is a more elevated country with a very broken surface, and containing numerous rocky hills, between which many lakes occur. The south-eastern edge of this tract seems to lie close to the course of the river Dnieper, from its source till it turns southward at the town of Orsha. From this elevated tract, which separates the upper courses of the rivers Dnieper and Düna, the watershed extends northward over the eastern portions of the governments of Vitepsk and Pskow, where it descends in low ridges to the lakes of Peïpus and Ilmen. The most elevated part of this tract probably attains 1000 feet above the sea, as the town of Mojaisk on the Moskwa is more than 700 feet above it. The watershed hitherto noticed divides the rivers that flow into the Baltic from those which run into the Black Sea. At this point however it divides, and forms two watersheds, of which one runs north-east between the watercourses that fall into the White Sea and those which run into the Caspian Sea, and the other runs south-east between the rivers which flow to the Caspian and those which fall into the Black Sea.

The north-eastern watershed begins in the hilly region of Valdai, which contains the source of the Volga, the largest river of Europe. It lies contiguous to the region just described, beginning on the west between the sources of the river Pola, which falls into the lake of Ilmen, and extending north-east to the river Msta. In this direction it occupies hardly more than 90 miles, but extends from north-west to south-east, between Novgorod and Vishnei Volotshok, more than 120 miles. The country rises from the north-west and south-east with a gradual slope, and at the town of V[illegible] attains an elevation of about 870 feet. On the most e[illegible] portion of it there are steep and rocky hills, which [illegible] do not attain a great elevation above their base, [illegible] highest of them, the Popowa Gora, according to Humb[illegible] does not exceed 934 feet above the sea-level. As this [illegible] was formerly covered with a continuous forest, it [illegible] known by the name of the forest of Volkhonsk. Fr[illegible] the banks of the river Msta the watershed extends n[illegible] towards the isthmus which divides the great lakes o[illegible] and Onega, but it does not reach it, as it turns again [illegible] north east, and remains about 20 or 25 miles fr[illegible] southern extremity of lake Onega, running betw[illegible] banks and the lake called Bielo Osero (White Lake). [illegible] ing passed between these lakes, it suddenly turns [illegible] south, and approaches the banks of the Volga (40° E. long.) within about 60 miles Between the river Msta and [illegible] E long. the watershed seems to be much lower than [illegible] hilly region of Valdai, as is proved by the facility [illegible] which canals have been made across it to unite the r[illegible] which fall into the lake of Onega or into the Dwina with [illegible] affluents of the Volga. The more elevated tract [illegible] its very gradual slopes, does not seem to exceed 20 [illegible] width, and is entirely covered with forests. Fr[illegible] E. long., or from between the towns of Vologda on [illegible] and Yaroslav on the south, the watershed extends e[illegible] near 59° N. lat., between the affluents of the [illegible] and those of the Volga, to 50° E. long., whence it declines to north-east and reaches the Ural Mountains near 59° E. and 61° 30′ N. lat., between the sources of the rivers [illegible] shora and Kolva; the latter is a branch of the Kama, an [illegible] ent of the Volga. East of 40° E long. no hilly region [illegible] to occur on the more elevated part of it; but the water[illegible] rises from south and north with a very gentle slope forming [illegible] broad-backed ridges, which extend between the watercourses until they sink gradually to the level plains which ex[illegible] along the large rivers. The whole region however is very imperfectly known, being covered with interminable [illegible] of pines and firs, and nearly uninhabited. This [illegible] of country is now called by geographers *uwalli*.

The south-eastern watershed begins likewise in [illegible] elevated hilly region which separates the upper courses o[illegible] Düna and Dnieper, and runs for some distance close to [illegible] banks of the last-mentioned river, so that the river Moskwa which originates in these parts, runs eastward to the Ok[illegible] an affluent of the Volga. It continues in a nearly souther[illegible] course from 55° to 52° 30′, and up to 53° 30′ seems to consist of a broad-backed swell, which is covered with forest[illegible] Between 53° 30′ and 52° 30′ it expands in wide and near[illegible] level plains, which occupy perhaps 100 miles in breadth, a[illegible] extend over the central provinces of Russia eastward up t[illegible] the banks of the river Volga, between 52° and 53° 30′ N. lat. in an eastern direction. These plains do not probably r[illegible] more than 800 feet above the sea-level, and are ch[illegible] woodless, though in some of the numerous depressions tre[illegible] of stunted growth are frequent. Where the wate[illegible] approaches the banks of the Volga, in the south overnment of Simbirsk, it forms an elevated ridge, all in width, which runs eastward, and compels the make a bend at Samara (near 53° N. lat.). On the bank of the river a similar ridge rises, which en- e river Sock, and continues in an eastern direction joins the Obstshei Sirt, or western branch of the Ural ins, near 56° E. long., not far from the place where laya, an affluent of the Kama, turns northward. rtion of the ridge which lies east of the Volga con- sandy hills almost without vegetation, and partakes of the nature of the steppes which lie south of it. tershed encloses the wide basin of the upper course Volga on the south, and divides it from the rivers un southward and unite with the Dnieper and the

es these two lines of watershed which cross Russia st to east, there is in the southern provinces an ele- act, the base of which is granite, and which traverses same direction, but does not form a watershed, be- ken through by several large rivers. At its western ty it is connected with the eastern offsets of the ian Mountains, which extend over the north-western of the government of Kishineff, or Bessarabia, and as far south as the town of Kishineff. From these he elevated tract extends eastward, occupying on the f the river Dniester the whole space between Yam- Dubossary, and rendering this part of the iver navigation by forming rapids and falls. Farther the banks of the Bug, it occurs near Olviopol, and e of the Ingool, an affluent of the Bug, between etgrad and Bobrinetz. It continues eastward to the r, which is compelled by it to make the great bend d between 47° and 49° N. lat., and in which it produces oges, or twelve waterfalls of Ekaterinoslaw. From e it declines more to the south, and extending along ks of the Konskaya, an affluent of the Dnieper, it ap- s the Sea of Azof, where it terminates, according to on the banks of the river Berda. But it is supposed continues from Ekaterinoslaw in a more eastern n, and fills up the great eastern bend of the river ich occurs between 48° and 50° N. lat.

– Russia has a much greater variety of soil than any ountry of Europe. Some very extensive tracts are more adapted for agriculture than the great African while others in fertility may be compared with those s without the tropics which are most favoured by

In taking this survey of Russia, we begin from th-east.

een the northern portion of the Ural Mountains on t and the river Mezen on the west, is the region of *dras*, which extend from the coast to 64° N. lat. and soil render this region unfit for cultivation. It y a plain covered with moss, which, for eight or nine , is frozen, and, the remainder of the year, is so d with water as to be rendered impassable. In some bushes occur, which bear berries. The few inhabi- ve on fish, which is very plentiful in the rivers, and themselves with the skins of the wild animals which those regions. The skins also supply an article of for which they obtain small quantities of corn, which ght from the countries south of the *uwalli* by the echora.

e south and west of the *tundras* extends the largest n Europe, if not on the whole globe. This region s the country on both sides of the upper course of iora, and all those which lie within the basin of the and its great branches the Sukhona and Vychegda. ing to official statements, the forests cover 150,000 miles. They consist almost exclusively of different f pines, especially *Pinus picea* and *Pinus sylves-* nd of firs, larch, and birch. Only a few spots country are cultivated, and produce rye, barley, d peas, as well as hemp and flax. But as the sum- very short, and, during this season, the weather very ed, fogs and rain being very frequent, the crops fre- fail, and they only yield from three to five times d. Hard frost continues from the end of October end of April. The scanty population is mostly oc- in bringing the produce of the forests to market, lly to Arkhangel. This region extends westward to er Onega, and southward to the *uwalli*, the northern y of which, chiefly occupied by swamps, but well , belongs to it. It comprehends the western portion of the government of Arkhangel and the whole of Vologda.

West of the river Onega begins the region of rocks and lakes. It extends over the immense tract which lies between the gulfs of Finland and of Bothnia on the west and south, and the White Sea on the north-east, and which is called by modern geographers the Isthmus of Finland. A line drawn from the mouth of the river Neva across the southern portion of the lake of Ladoga, and the southern shores of that of Onega to the lake of Latsha, indicates the southern boundary of this region; and another, drawn from the town of Uleaborg, on the shores of the Gulf of Bothnia, to the innermost recess of the Gulf of Kandalaskaya, separates it from Russian Lapland. This region extends from east to west about 500 miles, and from south to north more than 400 miles, and considerably exceeds the British Islands in extent. It has a much more broken surface than any other portion of Russia of equal extent. The northern portion, as far as 65° 30′, is level; at least it does not contain any continuous ridge of hills, and here the watershed is found to rise gradually, but not to a great elevation. Near 65° 30′ N. lat. and 30° E. long. a ridge of hills rises, which runs south to 64° N. lat., where it divides into two ridges, of which that which runs east divides the waters that fall into the White Sea from those that run to the lakes of Ladoga and Onega. After having passed the last-mentioned lake at a short distance, it approaches the banks of the Onega river, and then turns to the south-west, and terminates in that direction not far from the south-eastern shores of the lake. It is called the Mountains of Masielka (girdle), and, properly speaking, is only a huge swell of elevated ground with a broad-backed summit. It consists chiefly of sand-hills; but in some parts granite appears, and in such places the declivity is steep. The ridge which runs westward is mainly composed of granite, but it is of inconsiderable elevation, and grows lower as it approaches the Gulf of Bothnia, sinking down to the level ground at a considerable distance from the shores. The country surrounded by these two ridges, the gulfs of Bothnia and Finland, the river Neva, the lake of Ladoga, the river Swir, and the lake of Onega, has a rocky subsoil; and in many places the rocks rise above the surface, and constitute hills. They never form an extensive mass, but only low and narrow ridges, which alternate with wide and deep depressions, the greater part of which are filled up with lakes. It is supposed that one-fourth of the surface is covered with water. The general surface of the country appears to be lowest towards the east, north of the lake of Ladoga, where it probably does not attain 200 feet above the sea-level, and is less interspersed with rocks and lakes. But in approaching 30° E. long. it rises considerably. The lake of Saima, which lies towards the southern extremity of this rocky region, and is only divided by an isthmus, somewhat more than 20 miles wide, from the Gulf of Finland, is said to be 300 feet above the sea-level; and the numerous cataracts of the river Voxa, or Vuoxen, by which its waters are carried to the lake of Ladoga, support this assertion. If we consider that the lake of Saima receives the waters of numerous other lakes of various size, which extend in a line northward to 63° 30′ N. lat., a distance of 180 miles, and that the channels by which they send their waters downward have a very rapid course, and in some places form cataracts, it is not improbable that the general level of the country that surrounds the lake of Pielisyarvi, which is the most northern of them, may be 600 or 700 feet above the sea-level. The system of lakes which follows next to the westward is called, from the largest of them, that of Païana. The country along the shores of this lake is called Tavasteland, and is considered the most elevated portion of Finland; its general level is estimated to be 400 feet above the sea, even towards the south, where the river Kymnene, which issues from the lake of Païana, descends with numerous cataracts to the Gulf of Finland. The country seems not to be lower east of 24° E. long., until it approaches the Gulf of Bothnia within about 40 miles, to which it gradually descends in a rather gentle slope. The rocky elevations which divide the lakes from one another occupy only a small space, as level tracts, usually of considerable extent, lie between their declivities and the water-edge. The hills rise to different elevations, from 200 to 600 or 800 feet above their base, and frequently take the most fantastical shapes. Many of their declivities are covered with trees. All the northern shores of the Gulf of Finland, and the eastern shore of the Gulf of Bothnia, as far north as 64° N. lat., are high and rocky, especially the former. They are also lined with numerous rocks and small islands, which render the navigation difficult and dangerous; but good harbours and anchorage are found about these islands. Though the country rises as we proceed from east to west, the climate improves in the same degree, and vegetation and cultivation also. In the country surrounding the lake of Onega the winters are nearly as severe as on the Dwina in those districts where the Sukhona and Vychegda unite, and the soil principally consists of a mixture of clay and sand, in which the latter predominates. The cold and wet season is long, and renders the crops very uncertain; and owing to the poverty of the soil, agriculture is very limited. Rye, buckwheat, oats, and barley are cultivated in some places, and also hemp and flax, but by far the greatest part is still in a natural state. Pine-forests still cover more than nine-tenths of the country, perhaps not less than 30,000 square miles. There are few cattle in these districts, owing to the want of meadows, and the difficulty of maintaining them through a winter which lasts eight or nine months. But the more rocky country farther west contains extensive meadows along the banks of the lakes, and the rearing of cattle and the management of the dairy form the principal branches of rural economy. Agriculture is also much more attended to; and in addition to the grains which are cultivated farther east, some wheat is produced. Many tracts which are covered with bogs preserve the ice under their surface late in summer, and are the cause of night-frosts being felt to the end of May or the beginning of June. The climate is extremely wet, and much snow falls during the winter. A sudden thaw frequently fills the basins of the lakes to such a degree that the water rises several feet above the adjacent country, damages the winter crops, and renders the fields incapable of being cultivated for summer crops. With all these disadvantages, the western portion of this rocky country, Tavasteland, exports annually a considerable quantity of grain. Though the winter generally lasts from October to May, and the thermometer descends to 24° below zero, fruits, especially cherries, apples, and pears, succeed along the coast of the Gulf of Finland, and on that of Bothnia as far north as 64° N. lat. At Abo the mean annual temperature is 40°, that of the winter 24°, of the spring 40°, of the summer 50½°, and of the autumn 42°; but at the northern extremity of this region, at Uleaborg, the mean annual temperature is only 33°. The quantity of rain which annually falls is 24 inches. Spring does not appear before the end of May, when the birch comes into leaf, and the ice of the rivers breaks. In the middle of August, and sometimes at the end of July, night-frosts occur. Barley and some rye however are cultivated: they are sown and cut in the space of six or seven weeks. There are still extensive forests in this region, which chiefly cover the declivities of the rocky masses: they chiefly consist of pines and firs. The timber cannot be brought to market, on account of the cataracts which occur in all the rivers; but a great quantity of tar is annually made in these forests.

That portion of Russia which lies north of a line drawn from Uleaborg to the extremity of the Gulf of Kandalaskaya comprehends Lapland as far as it belongs to Russia. The surface is mostly a level, on which some sand-hills rise a few hundred feet above their base. There are numerous depressions on this plain, but most of them are of little depth, and form only extensive bogs; the deeper depressions are permanent lakes, of which some, as that of Enara, are of great extent. The sandy soil, being well saturated with moisture by the melting of the snow, affords pasture for a few months to a breed of small cattle, but especially to the numerous herds of reindeer. In the southern districts there are considerable forests of high growth; but towards the north they are less frequent, and the trees are of diminutive size. Some level and more fertile tracts occur along the banks of the lakes, on which rye and barley are cultivated, which commonly ripen in spite of the severity of the climate and the length of the winter. Even along the southern coast of the peninsula of Kola, the interior of which is rocky, but mostly level, though the shores are high and precipitous, rye and barley are cultivated. The early night-frosts indeed frequently destroy the crops: but when that is not the case, the labour of the husbandman is richly recompensed by a crop which produces twentyfold its seed. We have a set of meteorological observations made at Enontekis (68° 30′ N. lat.) in 1802-1805, according to which the mean annual temperature of that place did not exceed 27°, that of the winter was 0°, of the spring 25°, of the summer 55°, and of the autumn 26½°.

On the southern coast of the Gulf of Finland, the shores are composed of limestone, and rise abruptly from the sea like a wall to an elevation of 60 to 180 feet. From this elevated coast, the country extends in a level plain from 30 to 40 miles southward, and then descends to the plain of Livonia by a gradual slope. The surface of the plain is covered with a layer of mould of indifferent fertility, producing moderate crops of rye and barley. A part of the plain is covered with woods, consisting commonly of birch, but frequently intermixed with poplars and lime-trees: the last-mentioned trees constitute, in some places, extensive forests. The plain is furrowed by watercourses, which lie many yards below the surface, and the rivers which flow in them have a very rapid course, so as to be unfit for navigation, at least in several places. There are no swamps in this region.

Though both the northern and southern shores of the Gulf of Finland are elevated and rocky, the country that surrounds its innermost recess on both sides of the river Neva forms a depression which extends round the southern shores of the lake of Ladoga, and continues to the southern extremity of that of Onega. Towards the south it reaches, near 59° N. lat., the hilly tracts that branch off from the table-land of Valdai. A moderately thin layer of mould covers a subsoil of rock. The surface is level and very swampy, and though the soil is not devoid of fertility, it can only be successfully cultivated with great labour. Though situated in the immediate vicinity of one of the largest and most populous towns of Europe, only a very small proportion of the surface of this region is under cultivation, and about 20 miles from Petersburg the forests commence, which occupy nearly the whole of the country. The forests consist almost solely of fir and birch; pine does not occur except in a few spots which are somewhat more elevated and have a dry soil. Immense boulders of granite are dispersed through these forests. The mean annual temperature of Petersburg is lower than that of Abo, being only 37°: that of the winter is 16°, of the spring 32½°, of the summer 50°, and of the autumn 37½°. The mean annual quantity of rain which falls in that city is between 17 and 18 inches.

The table-land of Valdai and the elevated tract which extends from the river Msta to the lake Bielo Ozero (both which countries surround the plain just noticed on the south and south-east) were formerly covered with extensive forests, but the greater part of them have been cleared away, and certainly they do not now occupy one-third and perhaps not one-fourth of the surface. They chiefly consist of elms, birch, and poplar. The surface is undulating, and the rocky eminences which rise on it only attain a height of 100 to 200 feet above their base. Though grain succe very well, and the crops are rather abundant, the grea part is used for the maintenance of horses, which are in great request, as several well-frequented roads and t lines of canals traverse this region. The elevated and broken region which is contiguous to the table-land of Valdai on the west, and occupies the greater part of the governments of Pskow and Vitepsk, appears to be similar in its natural features, but the surface exhibits greater variety, lakes being very numerous, and probably their effects agriculture are as hurtful here as in Finland. But this tract is imperfectly known, as it is not traversed by any gr line of road.

A ridge of elevated ground of considerable width commences on the banks of the river Düna near Dünaburg, not far from which town the last rapids in the river occur. It extends northward on both sides of 27° E. long., and terminates on the banks of lake Peipus south of Dorpat. It appears that its average elevation is about 600 feet above the sea-level, at least the small lake near the town of Marienburg, which lies nearly in the middle of this ridge, has this elevation. But in some places there are hills which are from 300 to 500 feet higher. This sandy and sterile ridge separates the elevated table-land of Vitepsk and Pskow fr the low plains of Livonia, which extend westward fr to the shores of the Gulf of Riga. The eastern portion o plain, east of 26° E. long., is in general undulating, but in many places contains hills 400 or 500 feet high. In this tract the soil is chiefly loamy, and has a considerable degree of fertility. In the forests the birch prevails. To of 26° E. long., the country is nearly a level, exception of the southern districts between the d the river Aa, where there are some hills. The rg, near the town of Wenden, attains 1200 feet sea-level. The soil of the level portion of the plain ess fertile, the greater part of it consisting of sand, being saturated with moisture by the melting of , becomes fit for maintaining vegetation, and for grain, hemp, and flax. The forests consist mostly id occupy a considerable portion of the level ground. ates on the sea with a low, flat, and sandy shore.

amense tract of country which extends from the banks of the Düna southwards, having the swampy the east, and terminating in the great swamps of d Ratnor, is traversed from north to south by a table-lands, which occupy extensive tracts between and Vilia (an affluent of the Niemen), the Vilia iemen, and the last-mentioned rivers and the Bug, id eastward to the swamps. The tops spread out lains, the borders of which however are not well de- as they lower imperceptibly towards the rivers with gradual slopes. The more elevated portions of e-lands are from 400 to 800 feet above the sea-level, e soil is sandy and dry, but well penetrated by from the melting of the snow, they are covered e-forests, which supply the best pine-timber in This timber is floated down the affluents of the and is sent from Memel to England. On the hern table-land, between the Niemen and Bug, ources of the river Narew, and contiguous to the f Pinsk and Ratnor (between 52° 29′ and 52° ., and 23° 40′ and 24° 30′ E. long.), is the forest of which occupies more than 700 square miles, or extent of Westmoreland, and contains oak, fir, of immense size. It is said that no person has trated through this wilderness, as the interior with immense trunks of fallen trees. It is the where the *urus* is still found. [BISON.] The itries along the banks of the rivers have a tolera- soil, consisting of loam and sand, intermixed ial mould, the deposit of the inundations of the hey produce wheat, rye, barley, oats, buckwheat, . Cattle are not abundant, owing to the want of Horses are numerous, but of small size. The f this region is much colder than that of the along the Baltic under the same parallel. Even the n districts the mean annual temperature does l 42°. The winter is long and severe; the spring late. The summer is extremely variable; the dif- tween two days frequently amounting to 20° and ie heat is sometimes insupportable, but is soon y a cold wind. Fogs are very frequent in this Autumn is the most agreeable season, when the ry and warm; but the nights are chilly.

s to the survey of the basin of the river Volga, upies 650,000 square miles, and is equal in extent mes the area of France, and five and a half times ie British Islands. It constitutes the most im- nd, generally speaking, the most fertile portion of empire. The upper basin of the Volga compre- governments of Twer, Yaroslaw, and Kostroma. e of the river is 910 feet, the town of Twer 390 he town of Nishnei Novgorod, at the lower ex- this part of the basin, 230 feet above the level of o this region belongs a great part of the southern of the uwalli, or northern watershed. Between and Kostroma, the declivity of the uwalli ter- ibout ten or twelve miles from the Volga, but ist at a greater distance. Between it and the e is a level plain. This declivity is much less han the northern towards the confluents of a. The forests, which consist mostly of pines, ss than half its surface. The remainder is vered with morasses and moors, and partly with ere and there interspersed with tracts of sand. It ong the watercourses that cultivable tracts of mo- tent and moderate fertility occur. The plains banks of the Volga above and below Twer are ly fertile, and give tolerable crops of wheat, rye, its, hemp, and flax: the forests which lie within on their borders consist of oak, birch, ash, alder, , and pine. Farther down the land is less fertile, e climate seems to be more severe and less favourable to the growth of grain, hemp and flax, especially the latter, constitute the principal objects of agriculture. Extensive fields are entirely covered with flax. Rye and barley are cultivated with tolerable success, but wheat, oats, and peas do not succeed so well, and are little grown. A considerable portion of the flax and hemp grown in this country is consumed in the numerous manufactures which exist in the towns and even in the villages. Forests, chiefly of pine, are rather numerous. West of Kostroma however, where the plains increase in width, the soil is almost exclusively covered with sand, which produces few trees, and is only partially cultivated. In a few depressions there are meadows, but it is in general a very poor tract.

South of this portion of the basin of the Volga lies that of its affluent the Oka, which in some places extends to 52° N. lat., and is on an average 260 miles from north to south Not far from the banks of the Volga, the country south of it rises to an elevation of from 50 to 100 feet, generally with a steep ascent, but in several places with a long gentle slope. The country which hence extends southward is an undulating plain interspersed with a few hills of moderate elevation and gradual declivities. The general level of the surface rises very slowly, as the town of Moscow is only 416 feet above the sea, or only 26 feet higher than Twer, and no part of the intervening country much exceeds 600 feet; but towards the west it rises higher, as the town of Mojaisk is 700 feet. It rises probably also much higher towards the sources of the Oka (north of 52° N. lat.), but we are not acquainted with the amount of this rise. The soil, which near the Volga is of indifferent quality, improves as we proceed both south and east. In the government of Moscow it is fertile, but still more so in those of Kaluga and Tula, and a part of Orel. But on approaching the watershed in Orel, the soil, though clayey, is very dry, and partakes of the nature of the steppes which lie towards the Black Sea. The country to the west of Moscow has also a less fertile soil, and though a part of it is under cultivation, the crops are less abundant, and the forests, which occupy extensive tracts, consist only of scrub oaks. In proceeding east of Moscow through the governments of Vladimir, Riasan, and the northern districts of Tambow, the soil improves still more than it does towards the south. The rivers which intersect this extensive region, and generally with a northern and eastern course, run in narrow valleys from 50 to 100 feet below the surface of the plain. The river bottoms are chiefly covered with sand, and are utterly sterile; in a few places only there are meadows. The heights which enclose these valleys are steep. Forests are rare in the countries south of Moscow, but in the eastern districts they occur at certain intervals between the well cultivated fields, and consist of birch and fir, among which there are many tall oaks. Though Moscow is not situated in the very centre of this region, but rather towards its northern boundary, the climate may be considered as representing that of the whole country, as the districts farther south are more elevated. The mean annual temperature is 39°, that of the winter 13°, that of the spring 39½°, that of the summer 62°, and that of the autumn 40°. The mean annual temperature of the summer is one degree higher than at London, whilst in that of the winter there is a difference of 26°. In spring the difference is 15°, but in autumn only 4°. The number of rainy days is 205 in the year, but still the quantity of rain is small.

The middle basin of the Volga extends from the mouth of the Oka downwards to the ridge of Samara, and comprehends the four governments of Nishnei Novgorod, Pensa, Casan, and Simbirsk. It contains the most fertile part of the basin of the Volga, and perhaps of all Russia. Pallas repeatedly asserts that this region is the granary of the empire. The most fertile portion of it lies on the west of the river. Along its banks there is an acclivity from 300 to 500 feet above its lowest level; and the country at the back of this acclivity does not descend, but stretches out on an undulating level, here and there rising into hills covered with excellent soil. It produces abundance of wheat, rye, spelt, barley, buckwheat, and millet. Horses and cattle are numerous, but of small size. Sheep are very abundant, especially the broad-tailed kind. Oak is the most common kind of wood; birch and lime trees are also numerous, but the few forests of fir which occur in this rich loamy soil consist only of stunted and crooked trees covered with branches from the bottom to the top, and they cannot be used as timber. The region east of the river is not quite so fertile, but still it supplies rich crops, and is remarkable for the extensive forests of oak which occupy the higher grounds. These higher grounds are divided from the banks of the river by a low tract from four to six or even eight miles in width, which is partly covered with swamps, but partly supplies good pasture. The mean annual temperature of Casan is nearly equal to that of Moscow, being 37¾°, but the autumn and winter are much colder. The mean temperature of the autumn is only 33°, and that of the winter 10°, while the mean temperature of the summer is 65°, or four degrees higher than that of London, and that of the spring is 42°.

To the north and east of this portion of the basin of the Volga extends that of its largest affluent, the Kama, which is stated to comprehend an area of more than 200,000 square miles, or to be equal to that of all France. It contains the government of Viatka, the greatest part of that of Perm, and the northern portion of Orenburg. As this extensive region lies contiguous to the central and southern portion of the Ural Mountains [URAL MOUNTAINS], the country adjacent to the range is mountainous, being traversed by a few offsets of that chain. But the country lowers rapidly as we proceed westward. The town of Perm, hardly seventy miles distant from the great range in a straight line, is only 576 feet above the sea-level. Along the rivers there are valleys, or rather depressions, from ten to twenty miles wide, and between these depressions there is a swell of elevated ground from 200 to 400 feet above the valleys, the highest part of which is a level or undulating plain, equal in width to the adjacent depressions. Near the Ural both the valleys and ridges run parallel to the principal range of the mountain-system, but farther west they extend south-east and north-west. The higher portions of the country are entirely covered with forests, which towards the north consist of pine-trees, but towards the south the forests are intermingled with oak and lime trees. A great part of the lower country is also wooded, but extensive tracts have been appropriated to the cultivation of rye, barley, and oats. In a few places wheat is cultivated. In the most northern districts drained by the Kama there are extensive swamps, which render cultivation precarious, but still it extends north of the parallel of 59°. The southern portion of this region, on both sides of the Bialaya and Ufa, is very imperfectly known. In many parts it appears to resemble the woodless steppes farther south, but in others cultivation alternates with forests of deciduous trees, especially oak. The basin of the Kama contains the richest mines of iron and copper in Russia, and immense quantities of salt are extracted from salt-springs. In this region platinum has been found.

The lower course of the Volga traverses an immense steppe or desert, which not only extends over the whole of the lower basin of the river, but stretches out eastward to the banks of the river Ural, along the course of which it extends from its mouth to the place where it issues from the valleys of the Ural Mountains. This river constitutes the boundary of Russia towards the Kirghis Cossacks, whose country does not differ much in natural features from the great steppe which extends over the south-east of Russia. On the shores of the Caspian Sea the steppe extends from the embouchure of the river Ural to that of the river Kooma, which, with the Manytch river, constitutes the boundary of Russia in Europe. But the greater part of the country between the river Kooma and the upper course of the Manytch on the north, and the base of the Caucasus on the south, is a steppe of the same kind. The western border of this immense desert lies close to the right bank of the Volga. About 52° 30′ N. lat., or where the ridge of the hills of Samara is broken through by the Volga, there begins on its right bank an elevated tract, rising in general 300 feet, but sometimes 500 feet above the lowest level. This elevated ground continues without interruption to the place where the Volga turns to the south-east (48° 30′), and prevents all the rivers that originate west of its course from joining it, and compels them to run to the Don. The elevated ground does not cease at the bend of the Volga, but continues to advance southward along the left bank of the river Sarpa, an affluent of the Volga, which runs from south to north. Near the place where the Sarpa originates, the elevated ground, which has the form of a low mountain-ridge, between 51° and 46°, is gradually lost in the plain which extends north of the river Manytch. The steppe thus confined, as far as it belongs to Russia, contains, according to a rough estimate, an area of 306,000 square miles, or more than once and a half the area of all France. Though the whole of this region is unfit for cultivation, and supplies only scanty pasture for the herds of the wandering tribes which inhabit it, some parts are less arid, and have better pasture-grounds. That part of the steppe which lies west of the course of the Volga is called the Koomanian steppe. This portion of the great steppe is not a level, but the surface consists of gentle swells of a roundish form, so that the view seldom extends over many miles. The soil consists almost entirely of a yellow clay, and rarely of sand; it is impregnated with salt, and pits, or small salt-lakes, are common. Vegetation is confined to a few plants. The most frequent are a low-growing wormwood, some species of salsola, and a coarse grass which grows in tufts several feet from one another; between these tufts the yellow soil is without any vegetation. In no place does the grass cover the whole surface so as to form a turf, except in some of the deeper depressions, and in these the vegetation chiefly consists of salt herbs fit only for camels. The shore of the Caspian Sea between the mouths of the Volga and those of the Kooma is very low to a distance varying between 20 and 40 miles from the sea. It is inundated by the waters of that great lake when a strong south-easterly wind happens to blow for some time, and vessels are sometimes driven on the sand-hills which rise on the west of this level tract. These low hills appear to have been produced by the accumulation of the sand thrown out by the lake. At the back of these hills there are extensive salt-lakes, which once evidently formed part of the Caspian before the sand-hills existed. Among these salt-lakes those called Solenoé Khaki are very remarkable. They occupy a depression from twelve to fifteen miles in width, which [illegible] a very swampy surface, over which the salt-lakes are dispersed. In this tract the river Manytch originates: it runs nearly due west for about sixty or seventy miles, w[illegible] having passed the elevated ground which separates [illegible] Sarpa from the Don, it enters an arid plain of moderate width which extends westward to the mouth of the Don [illegible] Sea of Azof, and is enclosed on the south and [illegible] more elevated land. This level tract contained, at a [illegible] period, according to Pallas, the strait by which the Blac[illegible] was connected with the Caspian. The source of the Many[illegible] is divided from the low lands along the la[illegible] mentioned and those which lie along the lower banks of the river Ko[illegible] by small hills, entirely consisting of sand, between which [illegible]merous salt-pits occur. In Strabo there occurs a pa[illegible] which indicates that such a communication once existed. [illegible] the Caspian Sea, according to the latest measurement, is ab[illegible] 100 feet below the level of the Black Sea, it is suppo[illegible] that, before this communication was stopped, the surface must have been higher by at least 100 feet, and that the waters then covered the whole steppe, not only [illegible] Russia, on both sides of the Volga, but also that [illegible] Kirghis Cossacks, far beyond the shores of the Sea of A[illegible] Pallas, who first adopted this opinion, supports it by [illegible] that the innumerable shells which are scattered over [illegible] deserts exactly resemble those of the Caspian, and do [illegible] occur in the rivers; that the soil of this vast region [illegible] great uniformity, consisting, except the quicksands, [illegible] of yellow clay or sand combined with marine mud, [illegible] bed of clay at a considerable depth; and that this soil is impregnated more or less with saline matter, which in places forms salt pits and salt lakes. The western or [illegible]manian steppe however is the best part of the whole, at least of that which belongs to Russia. The number of Calmucks who find pasture for their numerous herds, consisting of camels, black cattle, horses, sheep, and [illegible] is estimated at 20,000 tents or families, besides a [illegible]able number of Cossacks, who possess portions o[illegible]. In winter, when the grass of the plains is entirely destroyed, their herds find abundant pasture on the swampy tracts along the banks of the river Sarpa, on the low shores of [illegible] Caspian, and on the more level ground of the river Ko[illegible] above Kislar. The wild animals, which abound in the steppes, are horses, saiga-antelopes [ANTELOPE, vol. ii., p. 73], foxes, wolves, and the *dipus jerboa* [MURIDÆ, vol. xv., p. 509].

The bed of the river Volga is from 40 to 60 feet below [illegible] level of the steppe. The river flows from the [illegible] Sarepta (48° 30′ N. lat.) in a valley from 20 to 30 miles wide, the surface of which is not much above the common level of the river. It consists of alluvial soil, and the river has accordingly formed on it numerous channels, w[illegible] frequently unite and separate again. Thus many formed, most of which, as well as the low tracts along river, are annually inundated for about two months, nd though they are thus rendered unfit for cultivation, are used as meadows and pasture-ground. Some of larger islands however, being above the reach of the ations, allow the cultivation of different kinds of ; and these are the only tracts in this region where is grown.

larger portion of the steppe is situated on the east of volga; and it is called by the Calmucks Gahsen, that the desert. This name however applies only to the and more sterile part, whose northern boundary is by the ridge of the Obstshei Sirt. This ridge of elevated ground is connected at its eastern extremity with the western ranges of the Ural Mountains, near 52° N. lat., it extends westward, and at first parallel with the middle course of the river Ural, to the place where the river urns southward. The elevated ground continues westward until it reaches the Volga opposite Kamyshin, between 51° nd 52° N. lat. The Obstshei Sirt rises with a gentle vity about 500 feet above the steppe, which extends its southern side, and is considered by Pallas to be the ntient coast-line of the sea, when the waters of the Caspian covered the whole plain south of it. It differs considerably from the steppe itself, the soil containing a considerable portion of black mould and being covered with . The northern part of the steppe is reached by a short ent on its northern side. This country is several feet re the level of the Black Sea, while the southern portion is considered to be between 50 and 100 feet below it. surface is also a level, in which the watercourses have e deep furrows. The upper level consists of a more e soil than that of the steppe, and is chiefly covered a tolerably good turf, but is without trees or bushes. No of it is cultivated, and it does not appear to be fit for vation. On the bottoms of the rivers however there wild cherry and almond trees and other shrubs, and ween them meadows. In some places these bottoms are lly cultivated.

the western extremity of the Obstshei Sirt, not far town of Kamyshin, begins the Naryn, an elevated of sand, which runs in a south-east direction through steppe, south of the Obstshei Sirt, and terminates rom the shores of the Caspian Sea. Its length is bove 300 miles, and it varies in width from 30 to 100 miles. The surface is covered with hills varying from 12 30 feet in height; they lie generally in groups close r, but sometimes the groups are separated from one by large level tracts. The hills consist of fine white intermixed with broken shells and decomposed lime, are quite destitute of vegetation; but it is remarkable a few feet below the surface spring-water is always d among these hills, and in some of the depressions y rare plants grow. On the west of the Naryn extends worst part of the steppe. It appears that a great depres- occurs here, which contains numerous salt lakes, which on the north with the lake of Elton, about 70 miles -west of Kamyshin, and extend parallel to the Naryn, h-eastward to the shores of the Caspian. The lakes separated from one another by level tracts, consisting ellow clay, without any vegetation, except in a few ed spots of small extent. In some parts there are ered with gypsum, and consisting of great masses ck-salt. The most southern of these hills of rock-salt, ia Gora, or Tshaptshatshu, is about 100 miles north town of Astrakhan. No use is made of the im- masses of rock-salt which occur in this tract, as that dity can be obtained with less expense from the lakes. ly the fine and pure salt which crystallizes along anks of the lake of Bogdoin Dabossu, was collected, it has been discontinued since 1807, on account of the of transport. This lake, which is 10 miles long wide, is about 25 miles from the Volga, near 48° N. Immense quantities of salt are obtained from the lake Elton, or, as it is called by the Calmucks, Altun, which near 49° N. lat. and 46° 40′ E. long., and is 12 miles with a width of nearly 10 miles. The surface of the s covered with a thick layer of salt, like ice. It has rownish-grey and reddish colour, and though not quite ure, is used in most parts of Russia. The government tains on the sterile banks of the lake an establishment out one thousand persons. The layer of salt is broken poles and collected on the shores of the lake, whence it is transported to the great salt depôt at Saratow, which, according to Erdman, contained some years ago thirty million poods of salt, a quantity which was estimated sufficient for the consumption of the whole empire for more than a year. Between the series of salt lakes which have been already noticed, and the banks of the Volga, is a tract of sandy hills similar to the Naryn, but of less extent. Though the vegetation of this tract is very scanty, it is much superior to that of the depression in which the salt lakes occur, and there are some spots which supply pasture. There are no permanent watercourses in this region, nor even temporary ones of any considerable extent.

That part of the steppe which lies east of the Naryn appears to be less sterile than the country just described. Here the soil consists chiefly of yellow clay, but is more intermixed with sand, and more fit for supporting vegetation. But the soil is also impregnated with salt, though much less so than the western part of the steppe, and some saline plants, with the short wormwood, on which the saiga-antelopes feed, are the vegetation most frequently met with. Three rivers traverse it from north-west to south-east; two of them are called Usen (the Lesser and the Greater), and fall into the salt lake Kamysh Samara, which sometimes discharges its waters into the river Ural by a small channel, but generally, like all the lakes of this region, has no outlet. The third river is called Kushum, and falls into the lake of Zagan, or Zagan-Nor. The two rivers Usen run in a bed from 15 to 36 feet below the surface of the steppe, which is a dead level, and the bottoms along their banks are from half a mile to two miles wide. They are covered with poplars, willows, wild olive-trees, and tamarisk shrubs, and constitute the only wooded tracts in the whole extent of the steppe; for the bottoms along the Ural river, which are from half a mile to a mile and a half wide, are subject to long annual inundations.

Though the Ural river is considered as the boundary-line between Russia and the country inhabited by the independent tribes of the Kirghis Cossacks, from the place where it turns westward, or from the redoubt of Oreskaïa, the Russians consider two localities on the south and west of the river as belonging to them, the rock-salt mines of Ilek and the salt-lake of Inderskoe. The first are about 80 miles west of the town of Orenburg, near the place where the small river Ilek falls into the Ural. They are the only mines of rock-salt which are worked in Russia. Great quantities of salt were formerly obtained from them, but in modern times they have not been worked to any great extent. The salt-lake of Inderskoe, which is near 49° N. lat., about eight miles from the eastern banks of the Ural river, is about 55 miles in circumference. Its surface is covered with such a thick layer of salt, that, according to Pallas, it may be crossed by a man, like a sheet of ice. Only the Cossacks who are stationed on the Ural river take from it as much salt as is required to cure the fish which are caught in the river. [URAL, River.]

No country on the globe is subject to a greater diversity of heat and cold than this steppe, especially the eastern part. The Ural, notwithstanding its rapid current in its upper course, is covered with ice at the end of October or the beginning of November, and it does not break up before the middle of April. During this season the frost is continuous and intense. The thermometer generally sinks 15° below zero, and continues so for several weeks together, and sometimes it descends to 30° and 35°. During this time a considerable quantity of snow falls, but it does not cover the ground, being carried over the plain by violent whirlwinds, which cause it to accumulate in certain places. The spring is very short. In the middle of May the heat begins to be oppressive in the day-time. In June and July the thermometer rises to 100°, and at Orenburg it sometimes attains 110°. The heat is generally attended with a total want of rain and a southern wind which dries up the water of the lakes and converts them into swamps. The nights however are cool. In September the heat decreases rapidly, and soon afterwards night-frosts become frequent. In this season rain is rather common. Thus the inhabitants of this region experience in winter a degree of cold which is not inferior to that felt on the banks of the Mackenzie river near the polar circle; while in summer they are oppressed by a heat which may be compared with that of the hottest month on the Amazonas, under the equator.

As no mountains intervene between this steppe and the western countries of Europe, the effects of this extraordinary climate are felt as far west as Great Britain. When the wind blows from the east between October and May, it is extremely cold, and more disagreeable than that from the north. Though the wind has passed over extensive regions before it reaches our coast, it has not entirely changed its character. On the contrary, when we experience an easterly wind between May and October, it is attended with a greater degree of warmth than the southern winds. In summer the thermometer rises in Great Britain highest when easterly and south-easterly winds blow.

That portion of southern Russia which lies west of the lower basin of the river Volga extends along the coast of the Black Sea as far west as the Danube and Pruth. It terminates on the south with the peninsula of the Crimea, which contains a mountainous and very fertile and also a level region: the latter exactly resembles the great steppe lying west of the lower course of the Volga. [CRIMEA, vol. viii., p. 158.] The country which extends from the shores of the Putrid Sea northward between the Dnieper on the west and the river Moloshnya on the east, as far north as 47° N. lat., is likewise a salt steppe; the waters of the lakes as well as those of the small rivers being slightly impregnated with salt. It is not however level, but the surface consists of an alternate succession of elevations and depressions. The higher land has a soil consisting of a reddish clay, which is very barren. In the lower tracts the soil is an intermixture of black mould and sand, and mostly covered with grass, which supplies tolerable pasture. The most western portion, extending between the Gulf of Perecop and the Dnieper to the Liman or æstuary of the last-mentioned river, is a sandy waste, which is entirely barren and uninhabited.

North of this country there is a steppe of somewhat different character. It comprehends the whole country south of the granite tract which traverses Russia from east to west, from the banks of the Don and the Ilawla (its confluent, which joins it at its most eastern bend) to the river Pruth, with a width varying between 80 and 120 miles. This tract also may be included within the steppe, being similar in soil and climate, and only differing from it in the form of its surface, which is more hilly. Towards its eastern extremity, near 40° E. long., between the town of Voronez and the Manytch river, the width of this region is near 300 miles; but towards the west it grows narrower, and from 33° E. long. westward it does not exceed 150 miles. Its length from east to west is 900 miles, and the area is about 180,000 square miles, exceeding that of the British Islands by more than 60,000 square miles. Want of wood and of water are its characteristic features. It is considerably more elevated than the low steppes near the Caspian Sea, and not impregnated with salt, except between the mouths of the rivers Dniester and Danube, where a low marshy tract extends some distance from the sea, and where salt-marshes of some extent occur. Towards the south and east the surface is mostly a dead level, with the exception of narrow tracts along the watercourses, which are enclosed by steep acclivities that form the boundaries of these bottoms. The bottoms have a fertile soil consisting of a black mould, and yield good crops; but they are too narrow to admit cultivation to a great extent. The higher and level grounds have an extremely hard clayey soil, which, for want of sufficient moisture, is unfit for cultivation; but they are not a desert. In spring they are covered with a fine turf, and supply good pasture for cattle and horses. Much grass is also cut for fodder. The want of fuel is a great inconvenience, but a certain weed called *burin* is used for fuel. In other places dried dung is substituted for it. Within the granitic tract the surface of the country is more broken, especially west of the Dnieper, and in these parts the narrow valleys between the low hills are chiefly covered with bushes, and contain many tracts fit for agricultural purposes. The summer is dry and hot. Rain is rare, and of short duration, and the thermometer rises from 90° to 100°. In autumn and winter whirlwinds are frequent; and though a considerable quantity of snow falls, it is swept by the winds from the extensive plains, and accumulated in particular spots, so that the country derives very little advantage from it. From December to February, the thermometer frequently sinks to 25° and 30° below zero. The spring and autumn are of short duration.

The country north of this extensive steppe may be divided into two regions. The western lies on both sides of the middle course of the river Dnieper. On the west of the river, it extends from the northern border of the steppe (between 48° and 49° N. lat.) to the great swamps of Pinsk and Ratnor (near 52°), and comprehends the governments of Podolia, Volhynia, and Kiew. On the east of the Dnieper, it comprehends the government of Pultava, the greater part of that of Tchernigow, and the western parts of Charkow and Kursk. It is designated by the general name of the Ukraine. The surface of this region is chiefly undulating, but in many places it extends in level plains. The soil mostly consists of a black mould, here and there interspersed with sandy tracts. The fertility in general is considerable, and in some parts, where loam is mixed with the mould, it is very great. In fact it vies in fertility with the country on the middle course of the Volga. Here the forests principally consist of oak, but they are much less extensive than in the neighbourhood of Casan. The eastern portion of the region lies within the basin of the river Don, between its upper affluents, and comprehends the eastern portions of Charkow, Kursk, and Orel, the whole of Voronesh, and portions of Tambow and Saratov. It appears to be more elevated than the western region, and partakes more of the nature of the steppe, as wood and water in many parts are scarce. The surface is also more undulating, and in many parts it rises into hills of moderate elevation with rather steep declivities. The soil consists of a mixture of clay and sand, and is not without a certain degree of fertility, though on the higher parts there are considerable tracts of sterile land. On the lower ground however cultivation in general, and the wheat which is grown here is of excellent quality. The wheat is sent to the town of Taganrok, whence a great quantity is annually exported. Though the difference of the temperature in summer and winter is considerable, it is much less than in the steppe farther south. Here also the rains are much more abundant, especially in the western region. The scarcity of rain in summer in the eastern region is one of the causes to which its smaller degree of fertility is ascribed.

In conclusion, if we view Russia as an ag[illegible] country, it appears that the most fertile region [illegible] nearly the central part of it, extending from bet[illegible] 48° 30′ and 52° on the west, north-eastward to between [illegible] and 56° N. lat. on the east. It lies between 25° and 50° E. [illegible] The central part of this region, that about the antient ca[illegible] and in the basin of the river Oka, is the least fertile [illegible] most eastern and western parts may be enumerated [illegible] the most productive countries in Europe. On both [illegible] of this central region the fertility decreases, but [illegible] towards the north than towards the south. On the [illegible] lies partly contiguous to the steppes of Southern [illegible] and those of the river Volga, but on the north [illegible] basin of the Upper Volga and the wooded region [illegible] sides of the uwalli separate it from the swampy d[illegible] which extend along the shores of the Arctic Sea.

Rivers and Lakes.—The principal rivers are noticed [illegible] the articles DWINA, VOLGA, DÜNA, NIEMEN, DNIESTER, DANUBE, DON, and URAL. As [illegible] level country, the rivers present a greater line of [illegible] navigation than those of most other countries. But a[illegible] rivers are not equally fit for navigation. Those wh[illegible] into the Gulf of Finland, or into the lakes of Lad[illegible] Onega, from the north, though they bring down [illegible] volume of water, are unfit for navigation, o[illegible] numerous rapids and cataracts. The rivers which [illegible] gulf and the lakes from the south generally present [illegible] impediments to navigation in their upper course, wh[illegible] also the case with the Düna, which falls into the [illegible] while the Niemen is navigable in all its extent, ne[illegible] source. In the Dwina there is no impediment to [illegible] tion; and the principal river and all its branches [illegible] ascended to a short distance from the places wh[illegible] originate. The Volga has the longest line of na[illegible] it flows more than 2000 miles, and in this co[illegible] cataracts, rapids, nor whirlpools. It becomes [illegible] about twenty miles from its source in lake Selig[illegible]. [illegible] northern affluents are navigable to an equal extent, [illegible] southern much less so, on account of the small [illegible] water which they bring down. The rivers which [illegible] the Black Sea are much less adapted for the transport of merchandise. Besides their comparatively small volume of water, owing to the scarcity of rain and snow, and the shallowness of their beds, their course is interrupted by rapids and cataracts, where they break through the granite tract which traverses Southern Russia.

Lakes are very numerous in certain parts of the empire lly in the north-west and south-east. Almost all the which occur in the salt steppes that surround the pian on the north, as well as in those of the Crimea and Nogay steppe, which lies north of the peninsula, are t lakes, and salt might be obtained from all of them. The es from which salt is actually obtained have been noticed fore, namely the lakes of Elton, Bogdoin-Dabossu, and derskoe. There are very few lakes in the interior of Russia, d they are all small; but those of the countries surround- the Gulf of Finland are very numerous. To the south t gulf a very great number of lakes is dispersed over country, between 55° and 60° N. lat., and between 27° d 30° E. long., especially over the southern districts. The t is the lake of Peipus or Pskow, which is nearly 90 long, and in its northern part nearly 30 miles wide. area is about 1500 square miles, or more than the y of Sussex. It is 10 fathoms deep in the centre, and dy facilitates the communication between the countries ng its shore; but it is less favourable to the communica- with the gulf, for its outlet, the river Narowa, though p, has a very rapid course, and forms, a short distance ove the town of Narva, a cataract 18 feet high, by which navigation is entirely interrupted.

In the country north of the Gulf of Finland there are eral systems of lakes, of which it is difficult to give any iption. The deep depressions between the rocks are with water, which sometimes expands to four or five s in width, and in other places contracts to a channel ly 30 or even 20 fathoms across, which however soon ens again to the dimensions of a lake. The wider parts these extraordinary pieces of water are dotted with rocks rocky islets. The most extensive of these systems of lakes hat which terminates on the south with the lake of Saima. e most northern watersheds belonging to it lie between '30′ N. lat., north of the town of Kuopio, and from thence series of lakes connected with one another by short and id channels extends in a south-south-west direction to slott (south of 62°), above which place it receives the ers of another series of lakes, which begin on the north near 63° 30′ N. lat. with the lake of Pielisyarvi, and nd southward. South of Nyslott the lakes lie from th-east to south-west, and continue to 61° N. lat., where terminate at the town of Vilmanstrand. Thus the le line of lakes, called the Saima lakes, is more than miles in length. The great volume of water thus col- ed is carried off by the river Woxa or Wuoxen, which s from the south-eastern extremity of the Saima Lake, and north-east to the lake of Ladoga. In some places larges to the width of a lake, but in others it is very ow, and forms so many waterfalls that no part of its rse is navigable. Near the village of Sitola is the ract of Imatra, which consists of a series of falls of lerate elevation, which lie within a space of 200 yards. lakes of Saima are also difficult to navigate on account he numerous rocks, but an active communication exists ween Nyslott and Vilmanstrand, by means of a few short which have been made. Farther west, near 25° E. , there is a similar but less extensive system of lakes, , from the name of the largest of them, is called that of ana, and which extends north and south. It discharges waters into the Gulf of Finland by the river Kymnene, is only from 40 to 50 fathoms wide, but generally from fathoms deep. It is not however navigable, as several acts occur in it, among which that of Högfors, a few from the sea, is 20 feet high.

e country which extends between the innermost re- of the Gulf of Finland, and that bay of the White Sea is called the Gulf of Onega, contains the largest in Russia and in all Europe, the Ladoga and the One- the lake of Ladoga is the largest. In length from th-west to south east it is nearly 120 miles, and its atest width is 70 miles. It covers an area of more than square miles, or nearly 500 square miles more Yorkshire, but not much more than half the sur- of Lake Ontario (11,600 square miles). A few islands occur along its north-western shores, but in the main body of the lake. The depth varies ly. In some places it is stated to amount to nearly 150 s, which considerably exceeds the greatest depth of tic, but in others it is shallow, and not deep enough ge vessels. The waters of a very extensive country in this lake. By the river Woxa it receives those of aima lakes from the eastern districts of Finland, by the river Swir the waters that are collected in the lake of Onega, and by the Volkhow those which originate nearly 300 miles south of it, and are collected in the lake of Ilmen The lake of Onega, which is nearly at an equal distance from the lake of Ladoga and the Gulf of Onega, is more than 120 miles long, with an average width of nearly 40 miles. The area is about 4350 square miles, or more than double that of Norfolk. Its depth is considerable, generally 80 or even 100 fathoms. Along the shores there are numerous rocky islands, but the main body of the lake is free from them. The waters of this lake are discharged into that of Ladoga by the Swir river, which is about 120 miles long, and flows through a low and swampy country overgrown with thick forests. Though a few rocks occur in the bed, it has no cataracts or rapids, and is navigated by large river boats. The surplus of the waters collected in the lake of Ladoga is carried to the Gulf of Finland by the Neva, which flows more than forty miles measured along the windings of the river, and after dividing near and in Petersburg into four arms, reaches the wide inlet at the western extremity of the gulf called the Bay of Cronstadt. Its width varies between 100 and 200 fathoms, and its depth is commonly three fathoms or more, so that the largest river-vessels can navigate it. There exists a small impediment to navigation near Pella, about half-way between Schlüsselburg, where the river leaves the lake of Ladoga, and Petersburg: it consists of a shallow, which is strewed with large stones. This place is now avoided by a short artificial cut, called the canal of Pella. The river is covered with ice from the end of October to the end of March.

Three of the smaller lakes require mention on account of the facility that they have afforded for establishing a water-communication by canals in the interior of Russia. The lake called Bieloë Ozero, or White Lake, lies between 60° and 60° 20′ N. lat. and between 37° and 38° E. long. It has an oval shape, extending about 30 miles or little more from east to west, and 24 miles from south to north. In the centre it is 24 feet deep, and even near the flat shores it preserves a depth of from three to five feet. The waters are rarely agitated by storms. Its outlet, the Cheksna, flows to the Volga in a southern direction. At a distance of about 40 miles from the Bieloë Ozero is the lake of Koobenskoë, which belongs to the basin of the river Dwina. It is about 40 miles in length from north-west to south-east, varying in width from five to ten miles. Several small rivers fall into it, and the lake is considered the source of the river Sukhona, one of the principal branches of the Dwina, which is navigable for large river boats, its depth varying between three and four fathoms. The third lake is the Ilmen, or Ilmen Ozero. It lies between 58° and 58° 30′ N. lat., and near 31° E. long., and has nearly a triangular shape, extending about 25 miles from east to west, and nearly as much from south to north. It receives a great number of rivers, and sends its waters to the lake of Ladoga by the river Volkhow. This lake is 450 feet above the level of the Baltic.

Canals.—The navigability of nearly all the Russian rivers to a very short distance from their sources, and the very moderate height of the elevated tracts, which divide the river systems from one another, above the level of the rivers that originate in them, facilitates more than in any other country the making of canals and the establishment of a continuous water-communication in the interior of the empire. Peter the Great perceived the advantages of such a water-communication, and he planned nearly all the canals which have been executed since his time, and some of them were even finished in his reign.

It has been already observed that those rivers which originate south of 55° N. lat. are much less adapted for navigation in their upper courses than those which have their sources farther north. This is mainly to be attributed to the dryness of the climate and the consequent want of water. When the attempt was made to unite the southern rivers by canals, this circumstance does not appear to have been known, or at least not to have been considered as an obstacle to the enterprise. But experience has shown that it constituted an insurmountable obstacle. All the canals which were undertaken in these districts have failed. Between 48° 30′ and 49° 20′ the river Don approaches the course of the Volga within 25 miles, and the Ilawla, an affluent of the Don, runs parallel to the Volga at nearly the same distance for more than 100 miles. A canal was made between the Ilawla and Volga south of Kamyshin by the Turks in the sixteenth century, and another by Peter the

Great, but though both are of considerable dimensions, there is not a drop of water in them at present. No water can be procured in the vicinity to feed them. Pallas thought that the most advantageous place for uniting the Don and Volga was where these two rivers approach nearest to one another. But by a levelling subsequently made, it was found that the country between them was 310 feet above the level of the Volga, and 210 above that of the Don. There being no water in the neighbourhood to feed the number of locks requisite for such a canal, the undertaking was never commenced. The river Don rises in a small lake called Ivanowskoe Ozero, and not far from this lake are the sources of the Shat, which falls into the Oopa, an affluent of the Oka. Peter caused a canal to be made between the lake and the Shat; and it is stated that in 1707 about 300 barges passed through it, but it does not appear that it was used afterwards; and when Alexander intended to re-establish the navigation, it was found that there was no water. The Shisdra, an affluent of the Oka from the west, originates not far from the Bolva, which falls into the Desna, a tributary of the Dnieper. In the beginning of the present century a plan was formed for uniting the Shisdra and Bolva by a canal, but no step has been taken towards its execution. It is very probable that this design also would fail for want of water.

On the contrary, all the canals which have been made in the northern provinces have succeeded completely. The three most important constitute a water-communication between the river Volga and the lakes of Onega and Ladoga, and consequently with the Neva and Petersburg. The most famous and most frequented of them is the canal of Vishnei Volotshok, near 57° 40′ N. lat. and 34° 30′ E. long., by which a direct water-communication is opened between Petersburg and Astrakhan, a distance of 3200 miles. Yet the canal does not exceed three miles in length. It traverses the town of Vishnei Volotshok, and unites the river Twerza, which falls into the Volga near Twer, with the lake of Mstino, which is about eight miles long, but hardly a mile wide, and from which the river Msta flows into the lake of Ilmen. A simple cut was made by Peter the Great, but as in course of time the number of vessels passing through the canal rapidly increased, the want of water was felt, and in modern times a large reservoir, the basin of Sawod, has been formed by collecting the water of several streams and small lakes. Other hydraulic works have been constructed in order to render the rapids which occur both in the Twerza and Msta less dangerous to the vessels, especially the largest of the rapids of the Msta, the Borovitzkoi Porog, where the river in the course of 20 miles descends 180 feet, and where many vessels were formerly lost. After descending the Msta the vessels were obliged to traverse the northern extremity of the lake of Ilmen, and then to enter the Volchow. But as the lake is subject to sudden gales, many vessels were lost. To obviate this danger a canal was made from a point about a mile above the embouchure of the Msta to the Volchow, along the northern shore of the lake. This canal, which is nearly six miles long and from 12 to 14 fathoms wide at its upper level, is called the canal of Novgorod, as it terminates in the vicinity of that town in the Volchow. The Volchow also offered many difficulties to navigation by the rapidity of its course, as it descends 450 feet in a distance not much exceeding 160 miles. Though the actual extent of the canals on this line of water-communication amounts only to nine miles, the works are very extensive and have cost large sums. With the exception of the canals in the interior of China, there is probably no canal which is more navigated than that of Vishnei Volotshok. The produce of the mines of Perm and Ekatarinburg, of the rich country and the oak-forests between Nishnei Novgorod and Simbirsk, and of the whole basin of the Oka, reach Petersburg and the Baltic by the Volga and this line of navigation. In 1828 the number of laden river-vessels which arrived by this route at Petersburg was 12,936; that of empty vessels 702, and that of rafts 6388; and since that time a considerable increase has taken place. The value of the goods thus transported to Petersburg amounted to 130 millions of rubles banco. The canals and rivers on this line are generally free from ice from the middle of April to the end of October.

The second line of water-communication is formed by the Tikhwina Canal, which is farther to the north-north-east, near 59° 25′ N. lat. and 34° 20′ E. long. This line of inland navigation begins in the Volga at the mouth of the river Maloga, north of 58° N. lat. and near 38° 30′ E. long. It ascends the last-mentioned river to its most northern bend, where it is joined by its large affluent the Chagoda or Chagodocha: it then follows the last-mentioned river to its junction with the Somino, which rises in the lakes of Somino and Eglino. The lake of Eglino is united by the Tikhwina Canal with the small lake of Lebidini, which is the source of the river Tikhwinka. The Tikhwinka runs westward into the Sias, which falls into the lake of Ladoga a few miles east of the embouchure of the Volchow. The highest level in this line of navigation is 564 feet above the lake of Ladoga, and only 162 feet above the level of the Volga at the mouth of the river Maloga. The canal itself is only five miles long and 36 feet wide at its upper level. A few cuts have been made in the Somino and Tikhwinka, but their length does not exceed four miles. The number of locks amounts to eighty-six, which occur in a space of about 120 miles. It was terminated in 1814, and improved between 1822 and 1828. Loaded barges can return by means of this canal from Petersburg to the Volga, which is very difficult by the canal of Vishnei Volotshok. In 1825 the number of loaded barges which went to Petersburg was 1815, of empty ones 276, and of rafts 1448; while from Petersburg 887 loaded and 665 empty barges returned to the Volga.

The third line of water-communication traverses the two lakes of Onega and Bieloë Ozero. The Kowsha, a navigable river, falls into the last-mentioned lake from the north-west; it rises in a small lake, the Kowshoë Ozero, on the highest part of the elevated tract which is the watershed between lakes of Onega and Bieloë Ozero. Some miles west of thi are the sources of the river Vytegra, which by a north-wes course reaches the lake of Onega. Between these two is the lake of Matko, whose waters, with those o Kowshoë, are used to feed the locks of three short whose length, taken together, does not exceed The fall of the Kowsha amounts only to 53 feet, an Vytegra to 302 feet; consequently the Bieloë Ozero 250 feet higher than the lake of Onega. The num locks is 31. But the river Cheksna, which issues Bieloë Ozero, and falls into the Volga at Rybinsk, some rapids, and in one place, above the town of povez, goods must be unshipped and transported by considerable distance. To avoid this inconvenie proposed several years ago to make a canal on the of the Cheksna, about twelve miles long. We do if this project has been executed. The canals by Kowsha is united to the Vytegra are called [illegible] ry honour of the wife of the emperor Paul [illegible] row paid the expenses of the undertaking. It 1808. By this communication 2280 loaded barges, and 5500 rafts, came to Petersburg in 1828. value of the goods brought to the capital in the tween 1825 and 1830 was, on an average, about ten of rubles banco; but that of the merchandise wh from the capital to the interior fell short of one mill Tikhwina and Mary Canals can only be navigated end of April to the middle of October.

On comparing these three systems of water-c between the Baltic and the Volga, as to le pears that the shortest is that through the Tikh by which the whole distance between Rybinsk and burg is reduced to 556 miles. Between the through the Mary Canals, it amounts to 71 through the canal system of the Vishnei Volotsho miles. Though the last is the longest route, it is rally preferred, and the value of the goods wh twelve years ago were brought to Petersburg by the Tikhwina, and Vishnei Volotshok canals was est the respective proportions of one, three, and ten.

As these three systems of inland navigation tra lakes of Ladoga and Onega, and the barges were obliged to pass over them, heavy losses of prope frequently incurred by the barges being swamped the gales to which the lakes are subject. To a dangerous navigation, canals have been made southern shores of the lakes. The most western called the Ladoga canal, unites the river Volchow w Neva; it is nearly 70 miles long, from 10 to 14 wide, from 4 to 7 feet deep in summer, and in spring. Nine locks are built on the nor discharge the superfluous water into the lake of La sixteen on the southern bank, to bring into ply of water as is required in summer. For the latter ose some steam-engines are also used. This canal was hed in 1733, but has since been improved at several s: the last occasion was in 1831. When the Tikhwina nal was made, this line of navigation was extended farther by the Sias canal, which runs along the southern of lake Ladoga to the mouth of the river Sias, is ly 7 miles long, 8 fathoms wide, and 5 feet deep. obviate the danger which the barges passing through the ary canals might encounter in navigating lake Onega, the canal was undertaken. According to the original it was to enclose the southern extremity of the lake, to unite the river Vytegra with the river Swir, more an forty miles distant from one another on the projected . But only one-third of this distance has been com- ted. The Onega canal begins in the river Vytegra, about miles from its mouth, and runs westward to the lake. about 14 miles long, 12 fathoms wide, and in general 7 t deep. The barges are therefore still obliged to pass over lake of Onega, a distance of about twenty-eight miles. e navigation on the river Swir is easy, and it has not ap- red to require any improvement. But from the embou- of the Swir to that of the Sias, where the Sias canal the barges must traverse a portion of the wide ex- of the lake of Ladoga, which is full of danger. A l was therefore made (between 1802 and 1810) from mouth of the Swir river to that of the Sias, which bout 28 miles long and from 13 to 22 fathoms wide; its level is seven feet below the surface of the Ladoga. It ed the Swir canal, and has no locks. Thus a line of surround the southern extremity of the lake of La- a, from the mouth of the Swir to the place where the a issues from the lake. The whole line is somewhat e than 100 miles long.

he lake of Bieloë and its outlet the river Cheksna have tly afforded the means of uniting by one system of the river Dwina and Archangel with the river , and with the city of Petersburg. This line of canals in the Cheksna, about twenty miles below its efflux the lake, near the town of Kirilow, whence it runs ward through several small lakes, of which the lake of nskoë is the most elevated. From this lake it de- by a few other small lakes to the river Porosowiza, alls into the lake of Kubinskoë. The last-mentioned is the source of the river Sukhona, the principal branch e Dwina, which is navigable for large barges from the e where it leaves the lake. The descent from the lake assirinskoë to the Cheksna is only 39 feet, and to the of Kubinskoë not more than 45 feet. The number of is only 13. The whole line between Kirilow and the of Kubinskoë does not much exceed 40 miles. This tion was begun in 1825, and completed in 1828. In t was used by 76 barges and 275 rafts. It is of great ortance for the transport of timber; the produce of the sive pine-forests on both sides of the Sukhona, which rly could not find a market, is now chiefly carried etersburg and to the Volga, where it finds a ready . This canal is called the Alexander canal, in honour prince of Wirtemberg of that name, who was active in cution.

the year 1825 was also commenced what must be con- red the most important of the canals of Russia, that of Moskwa and Volga. The abundant produce of the rich fertile country which lies to the south and east of the ent capital of the empire was, before the execution of canal, conveyed to the Baltic by a very circuitous After being embarked at Moscow, or some place neighbourhood, it was taken down the Oka to the of Nishnei Novgorod, a distance of nearly 500 miles. he last-mentioned place it ascended the river Volga town of Twer, a distance also of nearly 500 miles. At it was less than 100 miles from the city of Moskow, the of its embarkation, measured in a straight line. A , which would unite both places, would consequently a saving of 900 miles. This saving was to be effected Moskwa and Volga canal, which begins on the Volga mouth of the river Dubna, about forty miles below ascends the Dubna to its confluence with the Sestria, en the latter river to the vicinity of the town of Klin. lin the canal begins which leads to the lake of Gulzino, h constitutes the summit level, and where a reservoir d which covers about four square miles. This reser- contains a volume of water exceeding a million of cubic fathoms, which is furnished by some small rivers, the course of which has been diverted to it. From this lake the vessels pass by another canal to the river Istra, which passes near Voskresensk, and falls into the river Moskwa, about twenty-six miles above the city of Moscow. The descent from the lake of Gulzino to the Moskwa is 232 feet, and that to the Volga is 286 feet. We cannot learn if this work has been completed, or if it has answered expectation.

There are a few other canals on the outskirts of the empire which require notice. Near 61° N. lat. a canal unites the Vychegda, one of the principal branches of the Dwina, with the Kama, which is the largest affluent of the Volga, by forming a water-communication between two rivers called the Northern and Southern Keltma. This canal, which is called the Catherine canal, is not much used. The river Düna is united to the Dnieper by the Beresinskoï canal, which joins the Oola, an affluent of the Düna, to the Berezina, a tributary of the Dnieper: it lies between 54° 30′ and 55° N. lat., and between 28° and 29° E. long. The river Niemen is united to the river Dnieper by the Oginsky canal, which forms a communication between the river Szczara, a tributary of the Niemen, and the Yasiolda, an affluent of the Pripec or Pripeat; the last-mentioned river traverses the swamps of Pinsk and Ratnor, and falls into the Dnieper. A communication between the Vistula and the Dnieper exists by means of the Pina canal, which unites the river Mookhavice (which joins the Vistula at Brzesc Litewski) and the Pripec.

Climate.—The fact that the intensity of cold in Europe increases from west to east, is illustrated by the climate of Russia. While the mean annual temperature of the western coast of Norway as far north as North Cape is always above 32°, or the freezing-point, in a considerable portion of the most northern part of Russia the mean annual temperature is below 32°. This is the case with the whole of Russian Lapland as far south as 66° N. lat., or the parallel of Tornea. But east of the White Sea, the line which separates the countries which have a mean annual temperature below 32°, and those in which it rises above it, turns more to the south-east, terminating on the Ural Mountains near the most northern branches of the river Kama, in 60° N. lat. Thus the whole country drained by the rivers Pechora and Mezen has a climate the mean annual temperature of which is below the freezing-point. But this severity of climate does not prevent the growth of trees; along the upper courses of both rivers, forests of considerable extent occur. But where the mean annual temperature does not exceed 25° or 26°, which is the case near the mouths of both rivers, a shrub a few inches high is hardly met with. Yet, on the peninsula of Kola, where the mean annual temperature is certainly below 32°, barley is cultivated, and generally comes to maturity. That part of Russia in which the mean annual temperature is below 32° may be called the *Arctic Region*.

South of the Arctic Region lies the *Cold Region*, in which the mean annual temperature varies between 32° and 40°. The southern limit of this region begins on the shores of the Baltic, on the Gulf of Riga, about 58° N. lat., and runs hence east-south-east to the confluence of the Moskwa and Oka, near 55° N. lat., whence it continues in the same direction towards the southern extremity of the Ural Mountains, terminating south of Uralsk on the river Ural, near 51° N. lat. It probably extends farther south in the middle of the line, over the elevated region in which the Desna, Oka, and Don rise. The winter in the northern districts lasts from seven to eight months, and in the southern from five to six months; in Petersburg, from the end of September to the beginning of May. The Neva is generally covered with ice for 160 days, from the 27th of November to the 19th of April. The thermometer usually descends to 22° below zero at the end of December or in January, even at Petersburg, but farther inland the cold is greater. The quicksilver froze at Plostow in 1809, which indicates that the cold was at least 40° below zero. Both spring and autumn are short, and the passage from cold to heat, and *vice versâ*, is rather rapid. But in summer the heat is for two or three weeks very great. The thermometer then rises to 86° and even 90°. In the interior both the heat and the cold are greater than on the coast. At Casan the thermometer in winter generally descends to 28° below zero, and in summer it rises to 95° and 96°. Near the sea western and north-eastern winds prevail, but in the interior southern, south-eastern, and south-western winds are most frequent. The aurora borealis is frequently seen, especially in March, June, July, and September.

The *Temperate Region* extends over the southern provinces, as far north as the line above mentioned. Its mean annual temperature varies between 40° and 50°, but in the Crimea and in the country between the Dniester and Danube it rises to 54° and 56°. This region is distinguished by severe though short winters, and by long and very hot summers. Night-frosts are frequent in October and November, but continual frost does not set in before the middle of December, and it lasts to the middle or end of February. But in the elevated steppes west of the river Don, the frost is often interrupted by a few days' thaw, while such a phenomenon is of rare occurrence east of the river. The frost however is severe, the thermometer generally sinking in the western districts to 12° below zero, and in the eastern to 20°. In this season northern and eastern winds are prevalent. From the end of February the cold becomes more moderate, but the weather continues to be raw, and there are night-frosts during the north-east winds, which at that season are the most frequent. In the middle of May however a sudden change takes place. In a few days the heat increases to such a degree as to become oppressive. In June and July it still continues increasing, until the thermometer attains between 90° and 100°. From the middle of August however the heat rapidly decreases, and in September the thermometer frequently descends to 42° and even 40°: sometimes night-frosts occur. In the hot season south-east and east winds are prevalent.

The countries which border on the Baltic and on the White Sea have a wet climate, and rain is frequent all the year round: in winter a considerable quantity of snow falls. According to several statements, it appears that the annual quantity of moisture which descends in rain and snow on these countries varies between 16 and 24 inches. This wet climate extends only to the elevated tract which borders the basin of the Volga on the north and west, and in this humid region the interminable forests which cover it consist almost exclusively of pine, fir, larch, and birch. In the basin of the Volga the rains are much less frequent, except towards its western extremity, where short showers are experienced all the year round. But in proceeding farther east, the rain becomes scarcer, and in these countries the forests consist mostly of oaks, limes, ashes, and elms; pines and firs are rarely met with. At Casan the number of rainy days in the year does not exceed 90. The southern provinces have a still drier climate. During the long summer a drop of rain seldom falls, and even in the early part of the autumn there are only a few showers. At the approach of the winter, in November, rain is common, but it is soon changed for snow. Snow is only frequent in the beginning of the winter, and very little falls in January and February. Though the air is moist in spring, there are few showers; and even these entirely cease at the approach of summer in the beginning of May.

Productions.—Russia produces much more grain than is required for the consumption, and considerable quantities are exported. In most parts of continental Europe rye is used for bread by the mass of the people, and the cultivation of this grain is best adapted to the soil and climate of Russia. Except in the steppes and the Arctic region, it may be grown in all parts of the empire, even in those districts which have rather a poor soil. The greatest quantity is produced between the cataracts of the Dnieper on the south and the river Volga on the north, but the cultivation extends to the mouth of the Dwina, 65° N. lat. It does not always ripen north of the Volga, owing to the shortness of the summer and the moisture of the atmosphere; and it is generally necessary to dry the grain in buildings constructed for that purpose. The cultivation of barley extends to 67° N. lat., but not so far as on the coast of Norway, where this grain is grown to 70° N. lat. It is not grown to such an extent as rye. Oats do not succeed north of 62° N. lat. They are still cultivated on the banks of the Sukhona near Vologda, but not on those of the Vychegda and Dwina. In some provinces which have a poor soil, and in the districts through which the great roads and lines of inland water-communication run, the cultivation of oats is very extensive. Wheat is the principal object of agriculture in the fertile tracts along the rivers in the southern districts, but especially in those governments which are comprehended under the name of the Ukraine (Volhynia, Podolia, Kiew, and Pultava): farther north it is less grown, even in the fertile country which surrounds the great bend of the Volga. In some favoured spots it succeeds to 58° and even 59° N. lat. Millet is extensively grown in the elevated country which surrounds the upper course of the Oka, Don, and Desna, and in some other parts of the country, but the cultivation does not extend north of 55° N. lat. At the southern extremity of Russia, Indian corn is cultivated, in a country the mean annual temperature of which is only equal to that of England, but which has a much drier climate and a hotter summer. Its cultivation extends northward to the cataracts of the Dnieper, to about 48° N. lat.

Flax and hemp are more extensively grown than perhaps in any other country in Europe: both the climate and the soil are very favourable to their cultivation. Pallas observes, that on the steppes along the river Don, and even on those of the Volga near Sarepta, it is found in a wild state. In no part of Russia are flax and hemp grown to a greater extent than in the countries on both sides of the upper course of the Volga, in the governments of Twer, Yaroslaw, and Kostroma. Great quantities of both flax and hemp are sent to other parts, though the consumpt[illegible] very considerable in the numerous manufactures [illegible] these parts. Hemp and flax succeed as [illegible] N. lat., and both, together with hemp-seed and [illegible] constitute important articles of export from Ar[illegible] Petersburg, and Riga. Tobacco is much cultivated [illegible] Ukraine, whence it is exported to the neighb[illegible]tries.

The climate of Russia is not favourable to the c[illegible] of fruit-trees. With the exception of wild ch[illegible] some bad apples, no fruits grow north of 56° N. [illegible] Vladimir the first extensive plantations of cherry-[illegible]cur, and their produce is sent to Petersburg and [illegible] farther north. Other fruits are imported fr[illegible] countries, especially from the north of Germany. [illegible] and plums are only grown to any extent south of [illegible] lat. In the most southern districts there are [illegible] apricots, quinces, mulberries, and walnuts, and in [illegible]merous and extensive orchards of the Crimea there [illegible] also almonds and pomegranates. Grapes are chiefly [illegible]vated in the districts along the lower course of the [illegible] and on the Volga between Kamyshin and [illegible]epta, and in the Crimea. The wine made in these cou[illegible] was formerly of inferior quality, but the grapes [illegible] an important article of internal trade, and were [illegible] Moscow and even farther north. Since the b[illegible] this century however great improvements in [illegible] making wine have been introduced into the [illegible] the Don, by a Frenchman from Champ[illegible], [illegible] stated that the wine which is made in these parts [illegible]sively used all over Russia, and known there under [illegible] name of Donish wine, is hardly inferior to the [illegible] champagne.

Kitchen-gardens are not much attended to. [illegible] several kinds of cabbages, turnips, and carrots [illegible] are extensively grown; and in some places cuc[illegible] pumpkins, and radishes. Melons, and especially [illegible] melons, are very abundant in the hot and dry cou[illegible] the steppes, where they constitute in summer a [illegible]ble part of the food of the lower classes. Aspar[illegible] wild in the southern districts. Hops are freq[illegible] wild, but they are also cultivated. Liquorice [illegible]riantly on the banks of the Volga in the gov[illegible] Astrakhan, where it sometimes attains the [illegible] arm: it is taken to Astrakhan, where the juice is [illegible] and considerable quantities of it are exported. An [illegible] soda is obtained from different kinds of salsola [illegible] the steppes on both sides of the Volga.

The forests constitute one of the prin[illegible] wealth to Russia, and their produce, cons[illegible] fire-wood, tar, pitch, ashes, pearl-ash and potash, [illegible]ported to a large amount. It is difficult to say what [illegible] be the proportion of the surface of the country which [illegible] still forest, to that which is cleared or not covered [illegible] trees. The official statements which have been publ[illegible] do not comprehend those forests which are private pro[illegible] but they are limited to those that belong to the govern[illegible] It can hardly however be an excessive estimate, if w[illegible] that about three-fourths of the countries between 6[illegible] and the course of the Volga as far east as its great [illegible] near Casan, are covered with forests. In all these coun[illegible] only pine, fir, larch, alder, and birch are found, with [illegible] me-trees; ashes are rare. From these countries is derived greatest part of the produce of the forests which goes to markets. The forests are much less extensive of the upper course of the Volga. The central pro-inces, or those which are situated between the middle ourse of the Volga and the Dnieper, have hardly as much ood as is required for the consumption of a country subject a severe winter, and for the manufactures which are es-lished. In some parts even fire-wood is dear and scarce.

forests in the provinces west and east of the central untries are much more extensive. West of the Dnieper, the governments which formerly constituted a part of d, several extensive forests occur on the banks of the en and in the swamps of Pinsk and Ratnor. They hiefly consist of pine and fir trees, but birch and lime trees also common, and in some parts they are the prevalent ds. South of the swamps of Pinsk and Ratnor there some forests of beech, and this is the only part of Rus-where that tree is abundant. The great forests to the of the central provinces occupy a large part of the overnments of Perm, Viatka, Casan, Nishnei Novgorod, ensa, and Saratov. Those of the first two governments onsist mostly of the same trees as the more northern rests; but in the other governments the pine and fir trees rare, and are replaced by oaks, lime-trees, elms, and In these parts the proportion of the latter to the r is stated to be as 13 to 1. The oak-forests have en-the attention of government, on account of their at importance for the navy. A more exact survey of em was made some years ago, when it was found that all e forests of Russia did not contain more than 375,000 ll-grown oak-trees, that is, trees which were between 24 d 36 inches in diameter. The greatest number of them found in the large forest which extends on both sides the Volga, and begins at the town of Tcheborsar, some-at above the place where the river turns southward. is forest contained more than 100,000 full-grown trees. the neighbouring provinces the number amounted to 3,000. In the forests along the upper course of the lga, and farther westward to the Baltic, only 15,600 trees re found, and in the central countries, the government of lensk included, not more than 11,400 trees. The thern provinces of Russia are quite without trees. The k-tree is most common between 53° and 56° N. lat. Near Ural Mountains it is not found north of 57° N. lat., but ther west it extends to 59°, and a few trees are even nd in Finland north of 60° N. lat. In Sweden the oak ows north of 61° N. lat., and on the western coasts of rway between 62° and 63° N. lat.

The domestic animals of England are found in Russia, th the exception of rabbits. Horses are very numerous, d of various breeds. Those in the northern provinces are ther small, but the central and southern districts have rge breeds. Those of the Cossacks, Calmucks, and Kir-is, which pasture in the steppes, and become almost wild, e distinguished by their power of sustaining the great-t fatigue with very scanty food. There are also a few ld horses in the steppes. Black cattle is abundant, as is ident from the immense quantities of tallow and hides hich are exported, though the domestic consumption of th articles is very great. Sheep are still more nume-us. In some parts the great landed proprietors have be-n to improve the breed by introducing the Merino and axon sheep, and by crossing them with the native sheep. general however the wool is of an indifferent quality. uring the winter sheep-skins are the common dress of the er classes of peasantry. In the southern steppes there some peculiar species of sheep, among which the ghisian breed with the large bushy tail is the most rkable. Their wool, when full grown, is short and e, but the lambs have a fine and beautiful fleece. are more numerous in Russia than in other countries rope: the skins are used for making marocco lea-Hogs are generally reared, except in the steppes: are most numerous in the countries where there oak-forests, and in the western provinces, from a great number of hams and much bacon is to other parts of the empire. The nomadic tribes h wander about in the steppes keep a great number of ls: some rich proprietors have herds consisting of than 1000 head. In the government of Astrakhan aloes are kept, but they do not appear to be numerous. l, geese, and ducks are abundant; the two latter especially in those parts where there are numerous lakes and ponds. Reindeer are only kept north of 66° N. lat.

The bison [Bison, iv. 462], as already observed, still exists in the forest of Bialoviza, near the sources of the river Narew, a confluent of the Vistula. In the extensive northern forests there are elks, and several kinds of deer, hares, and wild hogs; the wild animals, which are killed for their skins, are also very numerous, as bears, gluttons, badgers, wolves, foxes, martens, polecats, weasels, ermines, otters, squirrels, and marmots. In the steppes there are wolves, foxes, and wild hogs; also wild asses, saiga-antelopes, konsaks, or foxes of the steppes, and the dipus jerboa.

Nearly all kinds of birds which are met with in England occur in Russia, and also the capercailzie and pelican: the last however only lives on the shores of the Black Sea and of the Caspian.

Fish is very plentiful in the rivers as well as in the White Sea and along the coasts of the Arctic Sea, but it is less abundant in the Baltic. The fish which are chiefly taken in the White Sea are haddock, cod, herrings, and the omul (salmo autumnalis, Pall.). In the Polar Sea, especially along the coasts of Nova Zembla, the whale, the walrus, narwhal (physeter macrocephalus), seal, dolphin, white fish (physeter catodon) and some other kinds are caught. A considerable number of families settled along the shores of the White Sea live by fishing. The most important fisheries in Russia are those of the Volga, the river Ural, and the sea of Azof. [Astrakhan; Azof.] The fish there taken are chiefly the beluga (accipenser huso, L.), sturgeon, sewruga (accipenser stellatus, Pall.), sterlet (accipenser ruthenus, L.), salmon, white salmon (salmo nelma), and the knife-fish (cyprinus cultratus, Pall.). The fish is sent to all parts of the empire, but is not exported to any large amount. Isinglass and caviare are sent to foreign markets.

Serpents and lizards are only common in the steppes. There are also swarms of locusts, which occasionally spread over the cultivated tracts within the steppes or those that border on them. They are not less destructive than those of Asia. Among the noxious insects are scorpions, millipedes (scolopendra millipes), tarantulas (aranea tarantula), and the scorpion-spider. Bees are found wild in most of those provinces which have large forests, but they are also reared by some of the natives who inhabit the countries at the base of the Ural Mountains and along the middle Volga, especially by the Mordwi. Though the consumption of wax is very great all over the country, especially in the churches, Russia still exports some wax. The honey collected in the districts where forests of lime-trees exist is highly valued, and fetches a good price. Several attempts have been made to introduce silk-worms, as Russia imports great quantities of silk from Persia for the manufactures in Moscow. The mulberry-tree thrives well in the southern provinces, and the silk-worm also succeeds.

Russia is rich in minerals. A gold-mine was formerly worked not far from the Gulf of Onega, near 63° N. lat.; but as the produce was small, and did not pay the expenses, it was abandoned in 1783. Gold occurs also on the western declivity of the Ural Mountains; but it has not yet been found in such quantity as to induce any person to collect it. Gold is found on the eastern or Siberian side of the mountains in considerable quantity. Platinum was discovered on the western declivity of the Ural in 1823, and has been worked since that time. The mines are near 57° 40′ N. lat., and the produce has always been on the increase. Between 1831 and 1834 it amounted annually to about 5000 marcs, and in 1836 to 8270 marcs. The number of mines is six, and they lie at a short distance from one another. No silver is found in European Russia, though it occurs in Siberia. But the greatest mineral wealth of Russia consists in its mines of copper and iron. Both these metals frequently occur on the western declivity of the Ural Mountains, from Slatoust near 55° S. lat., on the south, to 60° N. lat., and they are worked in many places. In 1782 the copper which was produced there amounted to 190,000 poods, and the iron to about 4,000,000 poods. It is stated that in 1830 the government of Perm, where the mines are most extensively worked, had 200 mines in operation, and that more than 7200 furnaces were employed. The number of copper-mines amounted to 27, with 200 furnaces. More than 180,000 men were directly or indirectly employed in this branch of business. The mines belong to the crown or to private persons. Those of the crown produced, in 1830, 41,000 poods of copper, 100,325 poods of bar-iron, and

1,050,000 poods of cast-iron. In those belonging to private individuals there were produced 90,000 poods of copper, and between 3½ and 4 million poods of cast-iron. The produce of the mines in the governments of Viatka and Orenburg is not stated. It is however supposed that in both taken together it fell short of that of Perm alone. Iron-ore however is not confined to the Ural Mountains; it occurs also on the southern declivity of the Uwalli, and on the table-land which extends about the sources of the rivers Oka, Don, and Desna. It is there found in the clay in layers, and sometimes only in lumps. Frequently it occurs in bogs and morasses. The quantity of iron obtained in these parts is considerable, and the extensive manufactures of Tula hardly use any other iron. Other metals are not worked, though it is said that quicksilver, arsenic, nickel, cobalt, antimony, and bismuth exist in several places.

Salt is an important article. We have already mentioned the numerous salt lakes in the great steppe to the east of the Volga and the rock-salt of Ilez. But the salt-formation seems to extend along the western declivity of the Ural Mountains, to the source of the Kama, and thence westward on both sides of the Uwalli. In all these districts salt is made from the salt-springs, which are numerous. The greater number of these salt-manufactures are contained in the governments of Perm and Viatka; but several of them occur in the basin of the Sukhona, a branch of the Dwina, and those near Totma are of great extent. The most western salt-work is at Staraïa Russia, a few miles south of the lake of Ilmen, by which some of the countries along the Baltic are provided with this article. But a considerable quantity of salt is imported into the last-mentioned countries, as the places in Russia where salt is made are very remote, and the expenses of transport are so great that salt can be got from France or England at a more moderate price.

Coal exists in a few places, as on the banks of the river Maloga, where it is found with iron-ore. Pallas says that it also frequently occurs in the vicinity of the river Donetz, and to the north of Taganrok, beyond the sources of the rivers which fall into the Black Sea: it is not worked. Other minerals are not much used, with the exception of marble and granite, of which there exist extensive quarries near the village of Tivdia, at the northern extremity of the lake of Onega; and at Serdobol, on the northern shores of Lake Ladoga. The marble is of a good grain; some is white, and some has a reddish colour with white stripes or spots. The granite is worked with great activity, as all the public edifices and many of the private palaces in Petersburg are built of it.

Inhabitants.—Russia is inhabited by a greater number of nations, differing in language, character, and civilization, than any other country of Europe. The inhabitants belong either to the Caucasian or to the Mongol race. The Caucasian however is by far the most numerous, as the nations of Mongol origin do not comprehend one-hundredth part of the whole population.

The Caucasian race in Russia consists of individuals belonging to Slavonians, Tshudes or Fins, Turks or Tartars, Germans, Jews, and Greeks. Nine-tenths of the population belong to the Slavonians. They are divided into Russians, Poles, Lithuanians and Lettes, and Wallachians and Servians. The Russians constitute more than two-thirds of the whole population, and their number is estimated at about 40 millions, and consequently they are equal to the Germans, who are considered the most numerous nation of Europe. They inhabit, to the exclusion of all other nations, the central provinces of the empire between the Dnieper and the Volga. On the banks of the Volga, and farther east to the Ural Mountains, a great number of Russian families have settled among the tribes belonging to the Tshudes and the Turks. On the banks of the Dnieper they are mixed with Lithuanians and Poles; but south of the swamps of Pinsk and Grodno the Russians are more numerous than the Poles. They likewise constitute the mass of the inhabitants in the northern provinces between the Ural Mountains and the White Sea, and in the southern between the Don and the Dniester. They are divided into Great and Little Russians. The latter inhabit the country called the Ukraine, or the governments of Tchernigow, Pultava, Kiew, Volhynia, and Podolia. The Cossacks are properly descendants of the Little Russians, and are intermixed with Poles, Tartars, and Calmucks. [COSSACKS.] The Great Russians, with the exception of a comparatively small number who have obtained their freedom, are bondsmen to the numerous body of rich nobles [illegible] among them. Among the Little Russians a [illegible] number of families are not subject to any master; [illegible] Cossacks are all free. The Russians have attained a [illegible] degree of civilization than is generally supposed, [illegible] dent from the care with which the soil is cultiv[illegible] more fertile provinces of the empire, from [illegible] activity [illegible] which the internal navigation is condu[illegible] and numerous manufactures in the govern[illegible] of [illegible] Kostroma, Moscow, Tula, and Kal[illegible] branches of manufacture they hav[illegible] selves, especially in tanning. Very few [illegible] more civilised nations have settled in those [illegible] exclusively inhabited by the Russians; and the [illegible] which they have attained, is as it were of native [illegible]

The Poles, together with the Russians, inh[illegible] vernments of Volhynia and Podolia, and al[illegible] that of Grodno. Their numbers within the [illegible] Russia amount to about four millions, to which [illegible] lation of Poland to the same amount may be [illegible] Poles, as a nation, consist of between nine and [illegible] but about two millions of them are in Prussia [illegible] As the country which they inhabit borders on a [illegible] Europe which is more advanced in civil[illegible] have adopted more refined manners; but [illegible] civilised life, especially in manufactures, and [illegible] of industry, they are behind the Russians. [illegible] territories of Russia the Poles are bondsmen to [illegible] but in Poland they are free.

The Lithuanians inhabit the countries adjac[illegible] northern part of Poland and to Eastern Pr[illegible] governments of Vilna and Minsk. Their num[illegible] exceed one million and a half. Though certainly [illegible] to the Slavonian family, their language is very [illegible] in its material and forms, but is intermixed [illegible] Russian terms. They are agriculturists, but [illegible] they have not made much progress in civiliz[illegible] of the Lithuanians, in Courland and Livo[illegible] Lettes, whose number probably does not much [illegible] a million. They speak a language different from [illegible] the Russians and the Lithuanians. They are [illegible] occupied with the cultivation of the ground. [illegible] live in Courland are frequently distinguished by [illegible] of Koors. Both nations, the Lithuanians and L[illegible] bondsmen to the German nobility established [illegible] country, till the reign of the emperor Alexander, [illegible] their emancipation.

The Vlaches, or Wallachians, only live in the [illegible] western angle of the empire, in the gover[illegible] sarabia, between the rivers Dniester and Pruth. [illegible] ber does not exceed half a million. They speak a [illegible] which is mainly composed of Latin, Greek, [illegible] Turkish words, which however have undergone [illegible] and corruption. They are industrious cultivators [illegible] land, but do not appear to have otherwise made [illegible] gress in civilization. They were formerly sla[illegible] boyars or nobility, but they ceased to be so [illegible] years ago. Among the Vlaches there are a few [illegible] Servians or Raizes, and a few more are settled in [illegible] vernment of Ekatarinoslaf.

The Tshudes, or Fins, were formerly considered to [illegible] to the Mongol race; but their light hair and their blu[illegible] have of late procured them a place among the Ca[illegible] race, in spite of their flat noses and flattened coun[illegible] They inhabit two separate portions of Russia. The [illegible] of them are settled on both sides of the Gulf of [illegible] Two of these nations, the Fins and the Laplan[illegible] cupy the country north of the gulf. The Fins, wh[illegible] Finland to the number of more than one million [illegible] half, are agriculturists and breeders of cattle: they manage their dairies with great skill. The Laplanders live north of 65° N. lat., and are mostly occupied with their reindeer. Their number does not exceed a few thousands. On the south of the Gulf of Finland are the Esthes or Esthonians, whose number is above half a million. Their language is similar to that of the Fins. They are almost exclusively occupied with the cultivation of the ground, and were serfs to the nobles until 1818, when the emperor Alexander effected their emancipation. South of the Esthonians, in the country lying on both sides of the small river Salis (near 58° N. lat.), is the small tribe of the Livis or Livemans, who have given their name to Livonia. It is supposed that they formerly extended to the northern banks of the

t were expelled from the southern districts by the
heir number does not exceed two thousand. They
alect of the Finnish language, and are exclusively
ists.

tern members of the Tshudic family are separated
western by an immense tract of country upwards
es in width, which is now inhabited by Russians.
l how the separation took place is not on record.
rn Tshudic tribes live on the western declivity
al Mountains, and on the banks of the middle
d are eight in number,—Syrianes, Permians, Votiakes, Chuvashes, Cheremisses, Mordvines or
nd Teptiares.

rianes, the most northern of these tribes, inhabit
country between the upper course of the Kama
ychegda, an affluent of the Dwina, and particu-
banks of the Vychegda, as far west as the mouth
sola. Their number is stated not to exceed 30,000.
cipal occupation is the chase of the wild animals
h their country abounds, Their language differs
from that of the Permians, which has preserved a
nity to that spoken by the Finlanders, but still
ers from it as to be properly considered a distinct
The Permians occupy the country south of the
between the rivers Kama and Viatka. Their
stated not to exceed 35,000 individuals. Though
e has made more progress among them than
Syrianes, they derive their principal subsistence
chase, and more especially from the fisheries in
and Viatka. Both tribes, the Syrianes and
though they have preserved their own dialects,
speak also the Russian language.

gules occupy both declivities of the Ural Moun-
reen 58° and 60° N. lat. According to the de-
f them by Pallas, it would seem that they rather
the Mongol than to the Caucasian race. They
n stature, have round faces with projecting cheek-
l very little beard. They may be compared with
cks. But on the other hand their language shows
belong to the Tshudes, though it exhibits so many
es as to have been sometimes considered a peculiar
The affinity of their language to that of the
in Hungary is stated to be very great. The Vo-
entirely on the produce of the chase. They live
cieties, consisting only of five or six huts, and lead
ng life. Their number is stated to amount to
ndividuals, of whom however the greater part live
e Ural Mountains in Siberia. A small number
converted to the Greek church; the remainder
ens.

tiakes are settled west of the Permians, on both
e upper course of the river Viatka, and in the coun-
the source of the Kama. In the conformation of
y they rather resemble the proper Fins than any
eastern Tshudic tribes; and their language has
eater affinity to that of the tribes on the shores of
of Finland. They are diligent agriculturists, ac-
o Pallas, and rear also cattle and bees. Some of
nts have more than fifty bee-hives. The wax and
sent to Archangel. Their number is stated to
0,000 individuals; and government has granted
rmission to live under magistrates of their own
chosen by themselves. They pay only a capitation-
st of them have embraced Christianity.

uvashes and Cheremisses live in the neighbour-
Casan, on both sides of the Volga. The first-
ribe is chiefly settled on the western side of the
the Cheremisses on the eastern. Single families
as far south as the town of Saratov. The number
huvashes is stated to be 370,000, all of whom, with
ption of about 3000, have become members of the
urch. In their personal appearance they resemble
ish or Tartar tribes, a circumstance which is attri-
their having lived for many centuries near the
f Casan. As to their language, a difference of
prevails. The French philologist Levesque, from
ination of a printed grammar of their language, is
n that it contains a large number of roots which are
to the Finnish language. But Lumley Davids
t the grammar of their language approaches very
the pure Turkish, that about three-fourths of the
e of Turkish origin, and the rest belong to the Ou-
d Samoyede languages, and that some few are entirely unknown. The Chuvashes cultivate the ground, and rear cattle and bees: the care of bees is a regular branch of rural economy. The Cheremisses are stated to amount to about 200,000 individuals. Their language seems to contain a much larger number of Finnish roots than that of the Chuvashes, but they are intermixed with a large number of Turkish origin. The conformation of their body likewise shows some mixture with the Turkish race. They are very diligent and intelligent agriculturists, and have large herds of cattle. The majority have adopted the religion of the Greek church, but many still adhere to their heathen ceremonies and tenets. All of them observe the religious festivals both of the Greek church and of the Mohammedans.

The Mordwi or Mordvines are settled west of the Chuvashes, in the country on both sides of the river Sura, which falls into the Volga from the south, between Nishnei Novgorod and Casan. On the west they extend to the very banks of the river Oka. They are divided into two tribes: the Ersad or Ersanes, who inhabit the tracts along the eastern banks of the Oka; and the Mokshad or Moskhan, on the banks of the Sura and Moksha. They are dispersed in the forests of the governments of Casan, Nishnei Novgorod, Simbirsk, Saratov, Pensa, and Tambow, and live intermixed with the Russians, with whom they communicate more freely than the Chuvashes and Cheremisses. Their number is stated not to exceed 92,000 souls. They are all Christians. They rather resemble the Russians than the Cheremisses and other Finish tribes. Their language is of Finnish origin. They cultivate their lands with great care, and their fields are not inferior to the best-cultivated grounds in Russia. They pay great attention to bees, especially the Mokshad, who have their lands in the middle of the extensive forests of lime-trees which are contiguous to the oak-forests. Some individuals have from one hundred to two hundred bee-hives. Their honey is preferred to that of any other part of Russia.

The Teptiares, the most eastern of the Finnish tribes, are settled on the banks of the Bialaya, an affluent of the Kama from the east. The origin of this tribe is of comparatively modern date. When the Russians, in the middle of the sixteenth century, took possession of the territories belonging to the khan of Casan, a number of Cheremisses, Chuvashes, Votiakes, and Tartars left their country and settled along the upper course of the river Bialaya, where they soon formed a separate nation, which however was subject to a tax which they were obliged to pay to the Bashkirs, in whose country they had settled. Though the Finnish element prevails in their language, it always contained a large number of Turkish words, which were further increased by their close connection with their neighbours the Bashkirs. They do not attend much to the cultivation of the land, but rear cattle and bees, and pass a great part of their time in hunting the wild animals with which their country abounds. Their number, which in the middle of the last century did not exceed 34,000 individuals, is stated to have increased to 110,000. They are partly heathens and partly Mohammedans. The exertions of the Greek clergy to introduce their creed among them have almost entirely failed.

The third great branch of the Caucasian family which inhabits Russia is the Turkish. They are generally called Tartars, but they call their language Turkish. They did not originally inhabit any portion of Russia, but came into it between the ninth and thirteenth century with the Mongols and other conquerors. The Turkish tribes at present existing in Russia are four, the Tartars of Casan, the Bashkirs, the Metsheriakes, and the Nogai Tartars. The Tartars of Casan are the most civilised nation in Russia. Their language, according to Lumley Davids, is the most cultivated and polished of the Turkish idioms. The attempts of the Greek clergy to convert them to Christianity have not been successful, and they are still Mohammedans; they take great care of the education of their children. They have schools both for the lower and higher classes of the people. In the elementary schools instruction is given in reading and writing, and the Korân and some other religious books are explained. The objects of instruction in the higher schools are the Turkish, Persian, and Arabian languages, and arithmetic. The priests are educated in an institution established for that purpose in a village called Gargali, which is about nine miles from the town of Orenburg. Those who are established at Casan, and in other towns, are either merchants or manufacturers. They traffic chiefly in tea, goods imported from Bokhara, and stuffs of European manufacture. They are very expert in tanning leather. The inhabitants of the villages are very careful cultivators of the soil, and also occupy themselves with rearing cattle and bees. Their villages are well provided with the most common mechanics, as tanners, shoemakers, tailors, dyers, blacksmiths, and carpenters. Like other Mohammedans, they are distinguished by their cleanliness. According to Erdmann, their number amounts to about 230,000, of whom about one-eighth have embraced Christianity.

The Bashkirs inhabit both declivities of the Ural Mountains, from 56° N. lat. southward to the sources of the river Ural near 54° N. lat. There is some reason for believing that this tribe has always inhabited the country which they now occupy, but it is quite certain that the present Bashkirs resemble in language and manners the Tartars of Casan, though in the form of their body they approach the type of the Mongols. The Bashkirs still adhere to a wandering life. In winter they inhabit villages, but in summer they ramble about in the country, sometimes to a distance of 60 or 80 miles from their villages. They cultivate some patches of land near the houses before they begin their wanderings, but the produce of these fields is not adequate to their consumption. Their riches consist in horses, of which the poorest peasant has from 30 to 50, and many have 500, and the richest from 1000 to 2000. Their horses are of a good breed. They keep only a small number of black cattle, sheep, and goats. They have also a great number of bee-hives, and they collect an immense quantity of wax and honey from the wild bees, which are nowhere more common than in the countries adjacent to the base of the Ural Mountains. They are good huntsmen, and know completely how to train the falcon for the chase. The smaller species are used by them to take hares, but the larger (Falco chrysaëtus) is used in hunting foxes, and even wolves. They sell a considerable number of these trained birds to the Kirghis Cossacks. The number of Bashkirs amounts to 150,000 individuals. The small tribes of the Metsheriakes, which do not exceed 20,000 individuals, live dispersed among the Bashkirs, and subsist on the produce of their herds of cattle and of their bee-hives. They also cultivate the ground, but not to a great extent. They are considered to be more civilised than their neighbours. Both tribes are Mohammedans.

The Nogai Tartars inhabit the Crimea and the steppe which extends north of the peninsula; they are also dispersed over the country east of the Sea of Azof, and along the northern base of the Caucasus. They are stated to compose a population of 600,000 individuals. A considerable number of them are settled in the valleys and towns of the mountainous part of the Crimea, where they are agriculturists, and have extensive orchards. They also manufacture leather, and make cutlery, saddles, and shoes. This portion of the Nogai has attained a considerable degree of civilization, and they are hardly inferior in that respect to the Tartars of Casan. Their number does not much exceed 250,000. The remainder of this branch of Tartars lead a wandering life in the extensive steppes which they inhabit. In summer they travel northward with their flocks, and sow a little wheat and millet in some convenient place. In winter they return to the shores of the Sea of Azof or some warmer tracts. Their herds consist of cattle and horses, but of a rather small breed: their horses are much prized, being strong, hardy, and tractable. The have numerous flocks of the large-tailed sheep. Notwithstanding their wandering habits, they have adopted a degree of civilization in their dresses and manners, which are derived from their kinsmen of the Crimea.

The number of individuals belonging to the Teutonic family is probably larger than that of the Turks. They are Germans and Swedes, with whom a few Danes are mixed. Numerous families of Germans are dispersed through the provinces along the Baltic, south of the Gulf of Finland, among the Lettes and Esthonians, and in those parts they constitute the nobility of the country. Most of these families settled there when the Order of the Knights Swordbearers was the acknowledged sovereign of these countries (from 1300 to 1530). Great numbers of German families are settled in the two capitals of the empire. When Peter founded Petersburg, he peopled it at first almost exclusively with Germans, and they constituted for several years the principal population of the town. Even at present their number is stated to exceed 24,000. The Germans are also numerous in all the sea-ports, in the southern provinces and in the Crimea; and along the middle course of the Volga a great number of German colonists have been settled at the expense of government in the last seventy years. The number of such colonists in the government of Saratow alone amounts to more than 30,000, and they constitute nearly the whole population of some towns and of villages.

The Swedes are numerous along the northern coast of the Gulf of Finland, and the eastern coast of the Gulf of Bothnia. In some places they constitute the whole population, to the exclusion of the Fins, but generally both nations live together. The number of Swedes in these parts probably exceeds 100,000, and there are also a few Swedish families in Esthonia.

There are no Jews in the central and north[illegible] but they are numerous in those parts which [illegible] longed to Poland, especially in the government [illegible] Grodno, Volhynia, and Podolia, where they are [illegible] sole inhabitants of the towns. They exercise se[illegible] of handicraft; they are smiths, tailors, shoem[illegible] They have also small breweries and distil[illegible] number is stated to exceed a million.

The number of Greeks probably does not [illegible] million. They are dispersed all over the [illegible] of the empire as merchants; and in the [illegible] a few villages entirely inhabited by them. [illegible] themselves with agriculture, especially [illegible]

The Calmucks show their Mongol o[illegible] their body, as well as by their language. [illegible] tribes of this nation which still exist in the [illegible] steppes of Russia are the remnant of those wh[illegible] Russia in 1770 and 1772, at the invitation of [illegible] government, and settled in the plains of S[illegible] are divided into five tribes. The Derbet [illegible] the most western, and occupy the country between [illegible] and the Don, on both sides of the river Sal. [illegible] west as the mouth of the river Manytch. [illegible] the Sarpa are two other tribes, the Erked and [illegible] who extend their rambles to the shores of the [illegible] fifth tribe, the Khoshud, live on the banks of [illegible] Volga, on both sides of the river. The first [illegible] most numerous, consisting of 12,000 kybitkas, [illegible] the four latter, taken together, probably fall s[illegible] number. In summer a part of them live [illegible] produce of the chase, of which the saiga ant[illegible] principal object, but in winter they depend o[illegible] herds. They wander about with th[illegible] the immense steppes. In a country [illegible] few patches of cultivable land, the Cal[illegible] management have succeeded in maintaining [illegible] camels, sheep, and goats to the number of th[illegible] heads. The value of the goods exported fr[illegible] to other parts of Russia is estimated at [illegible] half of rubles. They consist of wool, hair, [illegible] sheep skins, hides, and fur. The Calmucks are [illegible] and the only nation in Europe which prof[illegible] They have the different classes of priests [illegible] Buddhists, as lamas, gellonghi, gezuli, and ma[illegible] up to the end of the last century they were [illegible] ecclesiastical authority of the Dalai Lama, [illegible] L'hassa in Tibet, but in 1800 the emperor [illegible] them to choose their own Great Lama, to [illegible] the other lamas and priests are subject. The [illegible] are not immediately subject to the governor of A[illegible] but have their own political administration, of [illegible] of the Derbet tribe is the head. He is [illegible] counsellors and judges, and a person sent [illegible]

By the emigration of the larger number of C[illegible] 1771 and 1772, the whole steppe between the ri[illegible] and Ural south of the Obstshei Sirt was at [illegible] of its inhabitants, and remained in that state [illegible] or 1786, when a numerous tribe of Kirg[illegible] longing to the Little Horde of that nation, [illegible] civil wars then existing between the different [illegible] horde, was induced to submit to the Russian [illegible] and was settled in the tract which the Calmucks [illegible] doned. They are known under the name of [illegible] horde, from the name of their chief, called [illegible] troduced them into Russia. At that time [illegible] sisted of about 10,000 kybitkas, or families, [illegible] posed that the number may at present not [illegible] 120,000 individuals. In personal appearance, [illegible] resemble the Calmucks and other Mongol trib[illegible] anguage is Turkish, and it is supposed that they owe their rigin to several tribes of Mongols, which have united with urkish tribes, and in progress of time formed one nation. Like the Calmucks, they are nomadic herdsmen, but they ave only a small number of camels, the climate of their ntry being much more severe than the steppes farther t. They also keep some cattle and goats. Their wealth consists in horses and sheep. Some rich proprietors l to have 4000 or 5000 horses and 20,000 sheep. eep supply the principal articles of traffic, and nume- flocks are annually sold to the Russians at Orenburg, , and Astrakhan. Their agriculture is limited to the ug of some barley, and a small quantity of wheat and let. They are also expert hunters, and in winter kill the bearing animals, with which their country abounds, and ummer the saiga-antelope. The Kirghis Cossacks are mmedans, but far from being very exact in the per- ance of the duties prescribed by that religion.

(Pallas, *Reisen durch Verschiedene Provinzen des Rus- Reichs*; Pallas, *Travels through the Southern Pro- of the Russian Empire*; Erman, *Reise um die Erde*; wick, *Calmuc Tartary, or a Journey from Sarepta to ral Calmuc Hordes*; Erdmann, *Beiträge zur Kenntniss Innern von Russland*; Georgi, *Beschreibung des Rus- hen Reiches*; Klaproth, *Asia Polyglotta*; Rose, *Reise dem Ural, dem Altai, und dem Kaspischen Meere*; r, *Der Ugrische Volks-stamm*; and Schubert, *Reise Schweden, Norwegen, Lappland, Finnland, und In- ermanland.*)

iculture.—Notwithstanding the variety and great ce of the natural productions of the Russian , agriculture may be said to be even now in its age, since there is certainly no province which yields half of what it is capable of producing. Hence the greater part of the empire it is not so much the und itself that has any value, as the labouring popula- n, and accordingly it is not the number of acres in an ate that is considered, but that of the male serfs attached it. The Southern Baltic provinces, the governments near- st to scow, and the kingdom of Poland, have the greatest ion of cultivated land, and the best system of culti- , but it is only on a few estates that it approximates at of Northern Germany; yet even in these provinces re are extensive tracts in which not one-fifteenth part of surface is cultivated. The thinness of the population, the want of a market in the interior of the empire, con- bute to prolong this state of things; for where there is little nd for corn, agriculture languishes, however bountiful may be, especially when, as is here the case, the in- s are satisfied with having a sufficiency of the neces- life, and are too little advanced in the scale of civili- n to have any desire for the comforts or luxuries of a refined state of society. The whole area of European is (according to Schubert) 1,742,435,725 Prussian of which about 676,000,000 acres are covered with fo- nd shrubs: about 771,000,000 acres are to be reckoned olly unproductive, 246,500,000 acres at the most as le land, and 24,500,000 acres as meadow land. Of the ining land, not even a rough estimate can be given, for of all data respecting it in most of the governments. ount of the comparatively small value of land, and the of manure, the fields in Great and Little Russia are suffered to be fallow for two or three years. The times ring and harvest are regulated according to the climate. usual kinds of corn are grown in most of the govern- , viz. rye, wheat of many different species, barley, and maize, chiefly in the countries about the Black Sea, not a general article of food. The kind of pulse most ted is peas, which succeed up to 62° N. lat. Millet is about Tula, hemp chiefly in Little Russia. Flax and are cultivated in the Baltic provinces, and in West ia. Hops flourish in Poland and in Little Russia. The ration of the grasses is neglected. Schubert judges the official averages for several years, and from the of the quantity produced, that after deducting the re of seed-corn, and that used in the breweries, the leries, and for feeding cattle, besides the quantity ex- ted, there remain (in European Russia) about fifteen ster bushels per head. Between 1830 and 1841 ave been several years in which the harvests have , and instead of exporting, it has been necessary to allow importation of corn free of duty. This is at present the case, the crops in 1839 and 1840 having proved deficient. The government makes great efforts to favour agriculture. It endeavours to extend useful knowledge on the subject to all parts of the empire; many agricultural societies have been formed, and schools established, in which everything bearing on the subject is taught in the most simple manner. A school of agriculture has been lately formed at Gorygoretzk (a domain of the crown) near Mohilew; it is designed for educating 120 young men in such a manner as to qualify them for the management of great estates.

The breeding of silkworms promises to prosper in the southern provinces of the empire, that is, the Transcaucasian provinces, and in Taurida, the countries on the Volga between Saratow and Astrakhan, and the governments of Kiew and Podolia.

Manufactures.—The manufactures of Russia commenced, as in other countries, with the beginning of its political importance, but have been chiefly indebted for their encouragement and progress to the efforts of the government. The czars Ivan I. and II., who in the fifteenth and sixteenth centuries had restored Russia to independence, invited artisans and workmen from Germany, the Netherlands, and Italy, and established at Moscow, Yaroslaw, Smolensk, and Kiew manufactures of woollen cloth, linen, arms, &c. But the civil wars before the accession of the house of Romanoff, and the interference of Sweden and Poland, which led to the desolation of the country, checked the infant manufactures, so that in fact nothing was done till the reign of Peter the Great, who in this, as in many other respects, was the founder of the prosperity of Russia. He gave great encouragement to foreign manufacturers, and founded in the first instance great manufactories of arms at Tula, Petrosawodsk, and at Sestrabeck near Petersburg; and the great imperial manufactories of woollen and linen at Moscow. At Petersburg he established manufactories of articles of luxury, such as mirrors, expensive glass-wares, rich carpets, silks, cotton, &c. In all the larger cities he established at least one manufactory of woollen, linen, and metal, so that at his death there were twenty-one great imperial manufactories, and many smaller ones, partly supported at the public expense. Peter's system was not followed up by his immediate successors, but it was renewed by the empress Elizabeth, and has been steadily adhered to with constantly increasing energy, and the most brilliant success, up to the present time. It may perhaps be questioned whether many branches of manufacture may not have been forced into premature existence, for the protection of which it has been necessary to establish a most rigorous system, entirely prohibitory of many foreign articles, and imposing enormous import duties upon others. This system, it is true, chiefly affects the rich, for whose use foreign goods are imported. The chief seat of manufactures is Moscow and its government; and next the governments of Wladimir, Nischnei Nvogorod, Saratow, and Petersburg. In Poland, the woollen, linen, and leather manufactures attained great prosperity under Alexander. In 1828 there were in the empire 6000 manufactories, with 250,000 workmen, and in 1831 there were 100 with steam-engines. The exhibitions of the productions of Russian manufactures which have taken place within these few years at Petersburg and Moscow have greatly contributed to excite emulation. But the prices of most of the articles of Russian manufacture are still higher than in most other European countries. In general too the Russian workman finds it difficult to give to his work a high degree of perfection. He is indeed very clever, and imitates with wonderful facility, but as he attends mainly to external appearance, his works are deficient in quality and durability. There are exceptions undoubtedly, but it must not be forgotten that most of the manufactories have foreigners at their head. The Report of the department of manufactures for 1839 published in 1840 (that for 1840 has not appeared) contains the following statements:—

'The progress of manufactures in Russia has been so extremely rapid for some time past, as to excite general attention. The partial failure of the crops in some seasons, though it certainly had some effect on the inland trade, did not prevent an increase in the number of manufactories and of the workmen employed in them. The years 1835, 1836, and 1837 were more favourable to the development of the national manufactures; we have seen an increase of activity in all the provinces of our vast empire, and the progress made has far exceeded the most sanguine expectations. To give our readers an idea of it, it will suffice to say that in the year 1838 the number of new manufactories was 405. As we have not yet received all the accounts for 1839, we cannot state the number of new manufactories established in that year, but there is no doubt that it was as considerable as in the year preceding.

'The number of manufactories existing in Russia at the beginning of 1839 was 6855, and that of the workmen employed in them 412,931, not including those that work in the mines, and in the furnaces, smelting-houses, &c. dependent on them. In 1835 there were only 6015 manufactories in the whole empire, employing 279,673 workmen. Thus we have 840 new establishments in three years, and an increase of nearly 50 per cent. in the number of workmen employed.

'Among the most important branches of national industry, and the development of which has been the most remarkable, are the following:—

Manufactories of Woollen Cloths and other Woollen Goods	616
" " Silk	227
" " Cotton	467
" " Linen of all kinds	267
Tanneries	1918
Tallow Melting-houses	554
Candle Manufactories	444
Soap Manufactories	270
Metal-Wares	486

'The central part of the empire is the chief theatre of manufacturing industry. Moscow has become the focus of it; in the little towns of the government of which it is the capital, the number of manufactories continues to increase, so that at the beginning of last year there were in that government alone 1058 manufactories, with 83,054 workmen. In the adjoining government of Wladimir, there were 315 manufactories, with 83,655 workmen; and in that of Kaluga, 164 manufactories, and 20,401 workmen.

'The changes which have been effected in several other parts of the empire are not less remarkable. But lately Tula alone used to be mentioned for its manufactories of all kinds of metal articles; yet the 124 manufactories in that government (of which 39 are of metal articles) employ only 6538 workmen, though there has certainly been no relaxation of their activity; they therefore no longer hold the first place, since in the government of Perm alone, which at a pretty recent date was still almost a desert, there are now 352 manufactories (of which 81 are of metal goods, and 199 tanneries), with 36,600 workmen.

'Lastly we must mention, among the branches of industry, the increase of which has been the most remarkable, the manufacture of tobacco and snuff. In the year 1839 they furnished (including what remained of the preceding year's stock) tobacco, 3,800,000 lbs.; snuff, 2,200,000 lbs.; roll tobacco and carrot tobacco, 800 lbs.; cigars, 62,500,000 lbs. There were imported from foreign countries 84,141 poods in leaf and prepared; but 50,646 poods were exported. The excise duty on the tobacco consumed in the interior produced 2,670,374 rubles, from which must be deducted 300,000 rubles for the expense of collecting the duty.

'The above are the great manufactures properly so called. We have not the means of ascertaining the total amount and value of their products up to a recent date. The latest account that Schubert was able to procure in 1838, was that of 1828, in which year there were manufactured 20 million yards of linen, nine million yards of woollens (besides seven millions in Poland); 60 millions of calico; 2 million pounds of cotton-yarn; silks to the value of 4 millions of dollars; 15 millions of glass bottles; 80,000 chests of window-glass; three and a half millions of hides; 500,000 poods (at 36 lb.) of potashes; two million poods of soap; and 975,000 poods of sugar. Besides the workmen employed in these great establishments, there were 800,000 employed in handicraft trades, and a much larger number in the villages, in coarse woollen and linen manufactures, iron, and other metal-wares, or in preparing bast-mats, caviar, hogs' bristles, in dressing furs, &c.'

Commerce.—I. Inland Trade.—The inland trade is carried on in a very great measure by means of annual fairs, the most remarkable of which is that of Nischnei Novgorod, of which we have given a very detailed account. [NISCHNEI NOVGOROD.] The following is an official list of the principal fairs, and of the value in rubles of the goods exposed for sale in 1839:—'Nischnei-Novgorod, 161,643,674; Irbit, 41,829,674; Romna, first, 8,972,585; Romna, second, 24,661,026; Charkow, first, 20,360,360; Charkow, second, 17,386,235; Charkow, third, 6,261,605; Kursk, 21,401,630; Korsun, 2,969,023; Rostoff, 13,860,476; Sumy, first, 6,506,900; Sumy, second, 5,204,000; Saratow, 2,722,800; Simbirsk, 5,101,300; Tambow, first, 1,821,500; Tambow, second, 1,465,800; Taganrog, 2,030,781; Jakutsk, 1,593,671; Lebedjan, first, 2,143,416; Lebedjan, second, 2,334,955; Penza, 1,784,970; Nischnei-Lomoff, 1,926,970. The total amount is 353,894,722 rubles in bank assignats, which, reckoning the ruble at 10½*d.* English, is nearly 15 millions and a half sterling.'

In order to facilitate still more the commercial intercourse in the interior of the empire, the minister has organised, in different cities and towns, twenty-five new fairs and ten weekly markets. The inland trade is greatly promoted by the extensive system of inland navigation, of which the following is the summary for the year 1839:—'The goods designed for exportation are of course conveyed in a great measure by water from the most distant parts of the empire to the seaports. In entering into some detail of the navigation on the rivers and canals last year, we shall examine in the first instance their result as a means of aiding our foreign commerce. The following is the number of the barks and rafts which, coming from the provinces more or less distant from the sea, arrived in our principal seaports, with the value of the cargoes. 1. Archangel: barks, 1362; rafts, 1233; value of the cargoes, 15,281,505. 2. St. Petersburg: barks, 22,042; rafts, 784; value of the cargoes, 196,974,904. 3. Riga: barks, 1965; rafts, 1373; value of the cargoes, 32,437,878. Odessa, the most important of the seaports in the south of Russia, has not yet had any direct communication by water with the central provinces of the empire, but it is well known that the goods conveyed on the Dniester and Dnieper from the interior to the mouth of those rivers, are sent by coasting vessels to Odessa. 4. Cherson: barks, 398; rafts, 340; value of the cargoes, 4,065,835. 5. Taganrog, Nakhitschevan, and Rostow. These three towns, which are very near each other, all communicating with the interior by the Don, and with the Black Sea by the Strait of Kertsch, ought to be considered as one commercial entrepot: barks, 328; rafts, 114; value of the cargoes, 8,353,820. The number of barks and rafts and the value of the goods despatched on the Volga to the port of Astrakhan on the Caspian, were: barks, 346; rafts, 12; value of the cargoes, 6,238,877.

'The following is a summary of the navigation in all the rivers of Russia, in 1839. 1. Despatched from the several ports, 60,277 barks, 24,421 rafts; arrived, 46,850 barks, 17,469 rafts; value of the goods despatched from these ports 737,814,270 rubles; value of goods arrived, 538,981,[illegible] The difference which may be observed between the arrivals and departures, arises from the circumstance that a great number of the barks have been loaded or have arrived at intermediate places, the names of which are not stated.'

II. Foreign Commerce.

Value of exports:—

	Value.
To foreign countries	332,002,258
To Finland	2,901,767
To Poland	6,994,654
Total	341,898,679

Imports:—

From foreign countries	244,977,566
From Finland	1,543,680
From Poland	2,631,236
Total	249,152,476
Balance in favour of Russia	92,746,203

Principal articles of export:—

Wheat	4,754,473 chetwerts	85,255,396
Flour	3,633,468 rubles	
Cattle, furs, feathers, mats		12,727,[illegible]
Flax, hemp, linseed, hempseed, oil, tallow, hides, wool, bristles, timber, metals, &c.		203,642,738
Linen, cordage, woollens and cotton, candles, soap, coarse woollen cloth, exported to China, &c.		22,753,661
Brandy, dried and salt fish, fruits, honey, &c.		3,677,066

Principal articles of import:—

1. Rice, refined sugar, coffee, tea, wine, and fruits		62,448,655
2. Raw sugar		24,768,298
3. Various articles which cannot be placed among raw materials or manufactures, such as pearls and precious stones, books, engravings, furs, &c., cattle and horses from Asia, &c. . . .		15,868,667
4. Foreign manufactures of silk, wool, cotton, &c.		47,074,108
5. Raw materials for our manufactories: Raw cotton,	354,832 poods .	8,824,035
Spun cotton,	535,837 „ . .	30,304,689
Indigo,	35,500 „ . .	11,151,152
Cochineal,	4,409 „ . .	1,104,436
Madder,	154,811 „ . .	3,797,196
Dye-woods,	485,373 „ . .	2,775,072

The number of ships that *arrived* in all the ports of in 1839 was, with cargoes, 2426, of 429,214 tons; allast, 4192, of 792,166 tons; *sailed*, 6275, with car-oes of 1,025,642 tons; in ballast 307, of 57,994 tons.

The custom-house duties produced, in 1839, 91,889,696 ubles.

The following are the chief particulars of the foreign rce of Cronstadt and St. Petersburg in 1840:—Ships ived, 1213 with cargoes, of which 176 with corn, and 256 h coals, and 163 in ballast; 34 had wintered. The steamer ormed 42 voyages, and nine new ships were registered: ing a total of 1461, of which 675 were English, and e were probably many from England under other colours. he number of ships that sailed was 1445, of which 736 ere bound to England, 15 remained for the winter, and e was sold. Thus it appears that nearly half the import ade, and more than half the export trade, according to the umber of the ships, were on English account. The tonage of the English vessels, is, we believe, greater on an erage than that of any others employed in this trade.

The value of the goods imported into St. Petersburg in 840, on which the duty of customs was paid, amounted to ,026,194 silver rubles (the silver ruble is nearly three illings and three-pence sterling), including gold and sil-er to the amount of 3,350,050 silver rubles. The value of e exports on which duty was paid in 1840 was 36,536,814 lver rubles. The duties of custom raised in 1840 amounted 15,344,586 silver rubles.

Fisheries, see ASTRAKHAN; AZOFF; BALTIC; BLACK EA; CASPIAN; WHITE SEA; VOLGA.

Revenue.—The revenues of Russia have increased in extraordinary degree; Schnitzler estimates them at 12,000,000 rubles, exclusive of the revenues of Livonia, sthonia, Courland and Finland, and Poland. If we add e contributions in kind, the whole may amount to 00,000. The debts, which are of different descriptions ifferent rates of interest, were, in 1833, 863,249,849 bles; and new loans have since been contracted. The ebt may perhaps amount to a thousand millions of rubles, r about 40 millions sterling.

The Army.—The Russian army is much more numerous an that of France, Austria, or Prussia, and is composed of he following corps:—1, Imperial guard: 12 regiments of in-ntry, each of 3 battalions of 800 men, or 28,800; eleven egiments of cavalry of 800 men, 8800; artillery and ioneers, 2800; Cossacks, 800: in all, 41,200. 2, Infantry f the line, *a*, 138 regiments, each of 2400; in all, 331,200; , garrison troops, 104,032. 3, Regular cavalry: *a*, cui-ssiers, 20 regiments, 20,000 men; *b*, light cavalry; 64 giments of hussars and dragoons, 64,000 men: in all 84,000. , Artillery, 40,000; engineers, 10,500: making a grand otal of 612,000. To these are to be added 38 regiments of egular Cossacks, 19,000; 18 regiments of Don Cossacks, 18,000 men; 10 regiments of Tschernomorsk Cossacks, 10,000; 10 regiments of Ural Cossacks, 10,000; 3 regiments of Cossacks of the Volga, 3000; Siberian Cossacks, Calmucks, Tartars, Bashkirs, Caucasians, 40,000: in all, 100,000. These irregular troops are not to be reckoned as belonging to the standing army. We must observe that the numbers, though officially given, cannot be implicitly relied on; being often rather the proper full complement, than the number of really effective men.

The Navy is divided into five squadrons, 2 in the Black Sea, and 3 in the Baltic, called the Blue, White, and Red squadrons; each squadron consists of 1 ship of the line of 110 guns, 2 of 84, 6 of 74, 6 frigates, and some lighter vessels. The 3 Baltic squadrons are supposed to be always complete and ready for service. There is also the galley fleet of the Baltic, consisting of 20 galleys with 320 guns, 25 floating batteries with 160 guns, 81 gun-boats with 162 guns, and 88 smaller vessels; the squadron of 40 gun-boats of the Black Sea; the flotilla of the Caspian, consisting of 6 vessels of 6 to 18 guns, and 11 galliots; and the flotilla of Kamtchatka and Ochotzk, consisting of 3 vessels of 10 to 15 guns, and 8 galliots. These vessels are manned with 33,000 sailors, 9000 marines, and 3000 artillerymen. The navy has probably been increased since the publication of this official statement.

Education.—It is a fact which must not be lost sight of, that in Russia civilization and the instruction of the people have originated with the government, which has given the impulse to the nation, and consequently impressed the system of public education with one uniform stamp. The following extract from a manifesto of the emperor Nicholas, of the 13th of July, 1826, shows the spirit of the system now pursued:—

'Let the fathers of families direct all their attention to the moral education of their children. It is certainly not to the progress of civilization, but to vanity, which produces only idleness and vacuity of mind, to the want of real instruction, that we must attribute the licentiousness of thought, those unbridled passions, that confused and fatal half-knowledge, that tendency to extreme theories and political visions, which begin with demoralizing and end by ruining their victims. Let the fear of God, and solid and patriotic instruction, be the basis of all hope of improvement, the first duty of all classes.'

The institutions for public education are—I. The public schools of all classes under the minister of public instruction. These are—1, the parish schools; 2, district schools; 3, gymnasia; 4, the universities. II. The military schools. III. Ecclesiastical schools. IV. Special schools depending on different branches of the administration. Each university has three faculties—philosophy, jurisprudence, and medicine; and has several governments attached to it. The following is the state of the universities for 1839:—

Name.	Professors and Masters.	Students.
St. Petersburg . .	58	400
Moscow . . .	106	798
Dorpat . . .	65	525
Charkow . . .	77	391
Casan . . .	79	225
Kiew . . .	54	126
	439	2465

At Odessa there are three public institutions, viz.:—The Richelieu Lyceum, 18 professors and 57 students; ditto, Demidoff, 20 professors and 54 students; ditto, Besborodko, 18 professors and 45 students. White Russia, consisting of 6 governments, has 13 gymnasia, 2 noble boarding-schools, 16 district and 143 parish schools—in all 239 schools, with 11,530 scholars. Including the universities and the lyceums, the whole of the establishments under the minister of public instruction was, in 1839, 1905, with 97,912 pupils. Many schools have been founded in the Transcaucasian provinces, but the number of pupils is inconsiderable, probably not exceeding 1400.

2. The military schools, under the direction of the grand-duke Michael, contain about 9000 scholars; the naval schools about 2500 scholars. The military schools of all classes have 18,000 scholars.

3. The ecclesiastical schools of the Greek church were, in 1836, 384 in number, containing 58,586 scholars. The schools of the Roman Catholics, Protestants, &c. were 317, with 8803 scholars.

4. Special schools are under the several ministers; such as the establishments of the empress Maria, those under the reigning empress, and those under the grand-duchess Helen, besides the German, Tartar, and Jewish schools. The special schools are 1622 in number, and contain 127,864 pupils. The government contributes about 10,000,000 rubles to their support.

Population.—Various causes contribute to render the statement of the population very inaccurate and imperfect. The census in general gives the number of males only, from which the number of females is estimated according to the ascertained proportion in other countries.

RUSSIA IN EUROPE.

The Baltic Provinces.

Governments.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
1. Petersburg . Divided into 9 Circles.	18,600	950,000	St. Petersburg	476,386
			Cronstadt	53,244
			Schlüsselburg	4,000
			Narva	4,000
			Novaja-Ladoga	3,000
2. The Grand-Duchy of Finland Divided into 8 Provinces.	134,000	1,397,450	Helsingförs	14,000
			Wiborg	5,000
			Abo	14,000
			Uleaborg	4,000
			Biörneborg	3,000
			Lovisa	3,000
			Sweaborg	3,500
			Nystadt	2,500
			Friedricksham	2,000
			Carleby	2,000
3. Esthonia . 4 Circles.	7,224	282,000	Revel	15,000
4. Livonia 5 Circles.	17,340	754,000	Riga	71,228
			Pernau	10,000
			Dorpat	12,000
			Windau	2,500
5. Courland . 5 Bailiwicks.	10,000	503,000	Mitau	16,500
			Libau	6,500

Great Russia.

Governments.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
6. Moscow . 13 Circles.	11,500	1,500,000	Moscow	348,562
			Serpuchow	6,000
			Kolomna	10,175
			Borodino-Wireja	6,000
			Mosaisk	4.000
			Dmitrow	3,000
7. Smolensk . 12 Circles.	20,000	1,190,000	Smolensk	12,000
			Wiaesma	12,000
			Porestschje	6,000
			Roslawl	4,000
			Dorogobusch	4,000
			Gschalsk	3,000
8. Pskow . . 8 Circles.	21,960	900,000	Pleskow	12,000
			Toropez	12.000
			Wellikaja-Luki	3,800
9. Twer . . 12 Circles.	23,560	129,700	Twer	24,000
			Nschew-Wladimir	10,000
			Torschok	15,000
			Wischnei-Wolotschok	6,500
			Ostaschkow	6,500
			Kaschin	4,000
10. Novgorod . 10 Circles.	54,100	950,000	Novgorod	10,000
			Staraja-Russa	5,600
			Waldai	3,200
			Tichwin	4,100
			Kirilow	2,400
			Belosersk	3,000
			Borowitschi	3,000
			Ustjuschna	3,000
11. Olonetz . 8 Circles.	50,000	359,000	Petrozavodsk	4,000
			Olonetz	3,000
			Kargepol	3,000
12. Archangel . 7 Circles.	320,000	263,000	Archangel	17,000
			Mesen	2,000
			Onega	2,000
13. Wologda . 10 Circles.	161,000	830,000	Wologda	14,000
			Ustjug-Welliki	14,000
			Torma	3.000

Great Russia—continued.

Governments.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
14. Yaroslaw 10 Circles.	17,000	1,040,000	Yaroslaw	28,000
			Uglitsch	7,800
			Rostow	6,500
			Romanow	4,500
			Welikoje-Selo	3,500
			Rybinsk	3,600
15. Costroma 10 Circles.	30,000	1,450,000	Costroma	10,000
			Galitsch	6,500
			Sol Galitzkaja	3,500
			Makariew	3,000
			Kimschna	2,500
16. Wladimir 13 Circles.	17,500	1,400,000	Wladimir	7,400
			Murom	6,500
			Pereslawl-Saleski	4,000
			Gorochowez	2,800
			Susdal	2,500
			Schuja	2,000
17. Nischnei-Novgorod 11 Circles.	20,180	1,430,000	Nischnei-Novgorod	24,995
			Muraschkina	7,000
			Arsamas	8,500
			Pawlona Selo	6,000
			Podschinski	5,500
			Balachna	4,500
			Pogrow	3,500
			Gorodistsche	3,500
18. Tambow 12 Circles.	24,200	1,600,000	Tambow	20,000
			Koslow	8,200
			Kadom	7,000
			Kirsanow	5,000
			Schatzk	7,000
			Jelatma	6,000
			Morschansk	6,000
			Temnikow	4,500
			Lipetzk	6,500
19. Riäsan 12 Circles.	16,000	1,241,700	Riasan	9,000
			Saraisk	5,000
			Donkow	2,500
			Kasimow	10,000
20. Tula 12 Circles.	11,200	1,115,000	Tula	51,231
			Bjelew	7,000
			Wenew	3,500
			Odojew	3,300
			Jefremow	3,000
21. Kaluga 11 Circles.	10,560	1,220,000	Kaluga	32,345
			Borowsk	6,000
			Koselsk	3,500
22. Orel 12 Circles.	17,830	1,500,000	Orel	40,000
			Siäwsk	5,000
			Briansk	5,000
			Jelez	8,000
			Bolchow	14,000
			Karatscheff	6,000
			Liwny	6,000
			Mzensk	6,000
			Trubtschewsk	3,500
			Dmitrowsk	3,000
23. Kursk. 13 Circles.	16,580	1,527,000		25,000
				11,000
				10,000
				9,000
				7,000
				6,500
				6,900
				6,000
				6,000
24. Woronesh 12 Circles.	29,			43,800
				4,000
				2,500
				2,500

Little Russia.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
25. Kiew 12 Circles.	16,800	1,530,000	Kiew	44,633
			Uman	3,000
			Bialocerkiew	3,000
			Chodorkow	3,000
			Lisanska	2,800
26. Czernigow, or Tschernigow 12 Circles.	20,000	150,000	Czernigow (or Tschernigow)	10,000
			Neschin	16,000
			Novgorod-Seversk	8,000
			Gluchow	9,000
			Baturin	5,000
			Mglin	5,000
			Starodub	4,500
			Oster	4,000
27. Poltava 12 Circles.	22,300	1,950,000	Poltava	10,000
			Krementschuk	9,500
			Mirgorod	7,500
			Pereaslawl	8,000
			Kobiljaki	7,000
			Lubny	6,000
			Lokhwiza	6,000
28. Slobodsk-Ukraine 11 Circles.	29,000	1,331,000	Charkow	18,000
			Achtyrka	13,500
			Sumy	12,000
			Walki	10,000
			Tschugujew	10,000
			Bielopalje	10,000
			Lebedjan	9,000
			Bogoduchow	6,800
			Miropolje	6,800
			Krasnokutzk	5,000
			Smijew	5,000

South Russia.

29. Ekatarinoslaf 8 Circles.	25,000	791,000	Ekatarinoslaf	8,000
			Bachmut	4,000
			Taganrog	14,000
			Azof	3,000
			Nakitschevan	12,500
			Alexandrowsk	4,000
			Mariopol	3,500
30. Cherson	23,300	765,000	Cherson	14,000
			Odessa	73,000
			Elisabethgrod	12,000
			Nikolajeff	14,000
31. Taurida 6 Circles, with the country of the Tschernomorsk Cossacks.	22,500	520,000	Sympheropol	5,800
			Baktschisarai	10,000
			Feodosia	5,000
			Eupatoria	4,500
			Karasubasar	4,000
			Kertsch	4,000
			Sebastopol	4,000
32. Don Cossacks	53,650	640,000	Staro Tscherkask	15,000
			Novo Tscherkask	10,000
33. Bessarabia	16,800	720,000	Kischeneff	42,636
			Akjerman	13,800
			Ismail	12,500
			Bender	5,000
			Khotim	8,000
			Kilia Nova	3,500
			Beltzy	3,500

West Russia.

34. Wilna 11 Circles.	24,400	1,315,800	Wilna	58,000
			Kreydani	6,000
			Troki	4,000
			Kowno	6,000

West Russia.—Continued.

Government.	Area in English Sq. Acres.	Population.	The principal Towns.	Population.
35. Grodno 8 Circles.	14,000	800,000	Grodno	10,500
			Brzesc-Litewski	8,000
			Slonim	4,000
			Novogrodek	2,000
36. Witepsk 12 Circles.	16,800	935,000	Witepsk	15,500
			Polotsk	10,000
			Welisch	6,800
			Dünaburg	4,000
			Newel	3,000
37. Mohilew 12 Circles.	19,300	980,000	Mohilew	21,000
			Mstislawl	5,000
			Orscha	4,000
			Dubrowna	4,000
38. Minsk 10 Circles.	37,000	1,205,000	Minsk	20,000
			Sluzk	5,000
			Pinsk	4,500
			Bobruisk	4,700
			Dawidow	3,500
			Borissow	3,000
39. Volhynia 2 Circles.	28,300	1,500,000	Schitomir	8,500
			Berdykziew	9,000
			Krzemieniec	8,000
			Dubno	6,000
			Ostrog	5,000
			Staro-Constantinow	4,500
			Jaslau	5,000
			Olyka	4,000
40. Podolia 12 Circles.	14,500	1,550,000	Kaminiec	16,000
			Mohilew	7,000
			Staragrod	7,000
41. Provinces of Bialystock	3,400	251,000	Bialystock	6,000
			Ciechanowiek	2,700
			Siemiatyce	4,000
			Bielsk	2,000
Kingdom of Poland.				
42. Cracow 4 Circles.	4,000	440,000	Kielce	5,000
			Pinczow	5,000
			Slawkow	2,000
			Zarki	2,800
43. Sandomir 4 Circles.	5,500	415,886	Sandomir	3,000
			Radom	3,700
			Kozienice	2,200
			Opoczno	3,500
			Konskie	3,250
			Opatow	2,500
44. Kalisch 5 Circles.	6,540	649,328	Kalisch	15,000
			Petrikau	4,276
			Konin	3,600
			Wielun	3,000
			Sieradz	2,650
45. Lublin 4 Circles.	6,650	518,000	Lublin	12,000
			Zamosc	4,750
			Lubartow	3,200
			Krubieszow	4,000
46. Plock 6 Circles.	6,500	497,000	Plock	8,000
			Pultusk	3,760
			Wyzogrod	3,500
			Sierps	2,600
47. Masovia 7 Circles.	7,350	850,000	Warsaw	136,100
			Ozockow	8,000
			Lovicz	6,700
			Alexandrow	3,000
			Kutno	4,000

Kingdom of Poland.—Continued.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
48. Podlachia . 5 Circles.	7,250	381,700	Siedlce	4,420
			Sokolow	3,000
			Wengrow	3,000
			Miedzyrzyce	5,000
			Wlodowka	3,200
			Biala	3,000
49. Augustowo . 5 Circles.	7,820	566,685	Augustowo	3,300
			Suwalky	3,000
			Kalwary	5,500
			Szczuczyn	3,100
			Novomiasto	3,230
			Wilkowyszki	3,000
			Lomza	2,300

Russia in Asia.

Kingdom of Casan.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
50. Casan . 12 Circles.	23,500	1,220,000	Casan	59,000
			Tscheboksary	5,000
			Swiähsk	3,500
51. Wiätka . 10 Circles.	52,500	1,511,600	Wiätka	12,000
			Sarapul	6,000
			Ischewsk	8,400
			Slobodsk	6,000
52. Perm . 12 Circles.	127,000	1,488,800	Perm	10,000
			Ekaterinenburg	12,000
			Nischnei Newiansk	12,000
			Kungar	6,000
			Solimansk	5,000
53. Simbirsk . 8 Circles.	24,000	1,200,000	Simbirsk	13,500
			Syzran	7,100
			Samara	4,580
			Kuria Woloschka	3,000
			Alatyr	2,800
			Singilejew	2,500
			Karsun	3,400
			Staropol	2,200
54. Pensa . 10 Circles.	13,167	988,400	Pensa	11,000
			Saransk	9,000
			Nischnei-Lomoff	7,000

Kingdom of Astrakhan.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
55. Astrakhan . 4 Circles.	43,000	260,000	Astrakhan	45,703
			Uralskoi	15,000
			Tschernojarsk	6,000
56. Saratow . 10 Circles.	73,000	1,564,400	Saratow	42,371
			Wolsk	8,500
			Petrowsk	7,000
			Kusnezk	4,500
			Zarizyn	4,000
			Sarepta	3,000
57. Orenburg . 12 Circles.	127,235	1,771,000	Orenburg	20,000
			Ufa (the capital)	6,000
			Bugalma	4,700
			Wosresensk	3,500
			Menzelinsk	3,000
			Serginsk	3,000
			Troitzkaja-Kreport	3,000

Caucasian Provinces.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
58. Georgia, including Ossetia	17,500	450,000	Tiflis	40,000
			Signakh	3,500
			Duschet	2,000

Caucasian Provinces.—Continued.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
			Gori Elizabethpol Akhalzyk	3,500 12,000 15,000
59. Caucasia	40,000	150,000	Kisliar Mosdok Georgiewsk Stawropol	12,000 6,000 3,000 2,500
60. Daghestan	9,300	190,000	Tarki Derbend Kobetschi Karabudach	10,000 7,000 6,000 3,000
61. Imiretia	4,830	170,000	Kutais	14,000
62. Four Musselman Provinces, viz. Schirwan, Karabagh, Talischin, and Schenkin	9,145	135,000	Baku Alt Schamachi. Schuschi. Lenkoran. Nucha.	15,000
63. Armenia	7,850	160,000	Erivan Nakhitschevan Urdabad Megri	15,000 6,000 6,000 3,000
64. Guriel	1,422	64,000	Tilizighe. Poti. Bathumi.	
65. Mingrelia, Abchasia, &c.	7,200	430,000	Redoute-Kaleh. Anaklia. Sucham-Kaleh. Gelendschik. Sudschuk-Kaleh. Anapa.	
66. Circassia	32,250	550,000	No towns, but villages and Russian forts	[CIRCASSIA.]

Kingdom of Siberia.

(N.B.—The population of the governments according to Koppen, the area according to Cannabich.)

67. Tobolsk 7 Circles.	519,000	685,000	Tobolsk Tjumen Turinsk	20,000 8,300 6,000
68. Omsk 2 Circles.	325,500	600,000	Omsk Tara	2,000 3,000
69. Tomsk 6 Circles.	29,800	478,400	Tomsk Barnaul Schlangenberg Kaensk Kuznezt	9,700 6,000 4,000 3,500 3,500
70. Jenisseisk 4 Circles.	945,000	205,000	Jenisseisk Krasnojarsk	5,850 4,000
71. Irkutzk 5 Circles	150,000	507,000	Irkutsk Nischnei-Udinsk Werchnei-Udinsk Nertschinsk Kiachta Selingensk	15,800 3,000 2,600 3,600 4,000 2,600
72. Jakutzk	1,386,000	162,000	Jakutzk	3,000
73. Ochotzk	170,000	7,700	Ochotzk	1,600
74. Kamtchatka	84,000	4,500	St. Peter and St. Paul	650

The Islands in the Frozen Ocean.

Government.	Area in English Sq. Miles.	Population.	The principal Towns.	Population.
The Lena Archipelago . . New Sibera and some others.	2,000	500		
The Islands in the Pacific.				
The Nelken Islands				
St. Lawrence and St. Mathew .	1,000	500		
The Kurile Islands	3,000	1,000		
The Aleutian Islands	10,000	15,000		
Russian America.				
North-West Territory . .	500,000	61,000		
Total of the Empire	6,442,593	61,803,049		

If any differences should be remarked between the statements of the population in the above table and those in the several articles, they are occasioned by the receipt of more recent information.

(Stein's *Handbuch*, by Hörschelmann; Hassel's *Handbuch;* Cannabich's *Geographie;* Schubert, *Das Russische Reich;* Krusenstern, *L'Instruction Publique en Russie;* Schnitzler, *La Russie, la Pologne, et la Finlande;* Rose, *Reise nach dem Ural, &c.;* Eichwald, *Reise in dem Caucasus;* Erman, *Reise durch Nord Asien;* Von Wrangel, *Reise längs der Nord Küste von Sibirien, &c.; The Russian Official Journals of the Ministers of Commerce, Public Instruction, and the Interior, for the years* 1837-41.)

History.—The history of Russia cannot properly be said to commence before the middle of the ninth century of the Christian æra: though we obtain occasional glimpses of the various Scythian and Sclavonian tribes which roamed over its vast territory, little more can be ascertained than that it was divided into numerous small independent states, the two principal of which were Kiew and Novgorod. About A.D. 850 however a Varagian (probably Danish) freebooter of the Baltic, named Rurik, who had been called in by the people of Novgorod to defend them against their neighbours, made himself master of great part of the country, and founded a dynasty which continued to rule uninterruptedly till A.D. 1598. Oleg, the guardian of the sons of Rurik, seized Kiew by treachery (883), put the ruler to death, and made it the seat of government: and in 904? (various dates are assigned) conducted a fleet of 2000 canoes, carrying 80,000 men, from the mouth of the Dnieper to the attack of Constantinople, called by the Russians Czargorod, or 'city of Cæsar.' This first attempt was frustrated by a tempest: and a second expedition in 941, under Igor the son of Rurik (879-945) was defeated by the operation of the Greek fire, which destroyed the Russian flotilla. A communication was however opened between Russia and Greece, and Olga, the widow of Igor, was baptized at Constantinople (955) by the name of Helena; but her son Swatoslas obstinately adhered to the idolatry of his fathers, and fell (973) in an invasion of the Greek empire. But the reign of St. Vladimir the Great (980-1015) was the æra of the conversion of Russia. Vladimir himself, who had married Anna, sister of the emperor Basil II., became a Christian according to the Greek church in 988, and his example was speedily followed by his boyars, or nobles, and all his subjects. He subdued Halicz, or Galicia, and reduced to subjection the Patzinaces and Khozars, a barbarous race in South Russia; and is said to have been the first who assumed the title of grand-prince, or grand-duke (Veliki-Knez). At the death of Vladimir, his dominions were divided and disputed by his numerous sons; and though Yaroslaf, whose reign was signalized by an unsuccessful attack on Constantinople in 1043, reunited them for a short time, a second partition took place at his death (1055); and Russia was overrun for half a century with constant civil wars and Polish invasions. Vladimir II. (1113-1125) re-established in some degree his power as paramount sovereign; but disorder soon recommenced, and the authority of the grand-prince of Kiew was continually curtailed by the erection of petty sovereignties under the different branches of the house of Rurik, till Andrew I., prince of Vladimir, or White Russia (1057-75), arrogated to himself the title of grand-prince of Russia, while the elder line reigning at Kiew sunk into a subordinate rank; and Novgorod, though still retaining the forms of princely government, had become in effect a free republic, and was the centre of an extensive traffic with both Europe and Asia. The annals of this period present only an unceasing succession of devastating struggles between the different principalities (in one of which Kiew was sacked and almost ruined (1168) by the troops of Vladimir), and wars with Poland for the possession of Galicia. The death of almost every prince was followed by a contest among his sons; but these scenes of discord and bloodshed are diversified by no event of historical importance, till the invasion of the Tartars (1223) produced a momentary unanimity from the sense of common danger. These barbarians had already under Genghis-Khan overrun and subdued the greatest part of Asia; and a host of 500,000 men under Toushi, the son of Genghis, encountered and overthrew the combined forces of the Russian princes on the river Kalka, near the Sea of Azof: but though the death of Toushi diverted the victors from the immediate completion of their conquest, they returned in 1236 under his son Batu, and laid waste the whole country with fire and sword. Youri, or George, grand-prince of Vladimir, after seeing his capital destroyed and his family massacred, was slain in battle; Kiew shared the fate of Vladimir (1240): all the cities and principalities of Russia (with the exception of Novgorod) were involved in indiscriminate ruin and slaughter, and the whole country fell under the yoke of the enemy.

For more than two centuries and a half after this conquest Russia continued to be held in abject vassalage by the Tartars of Kapchak, whose hordes overspread the eastern and southern provinces, and the plains between the Caspian and the Volga, on the banks of which river the Golden Horde, or imperial residence of the khans of the race of Batu, was fixed; but the interior of the country was still left under the government of the native princes, who were compelled to present themselves at the Golden Horde to receive investiture and to perform homage; and to such an extent was their humiliation carried, that on the annual visit of the Tartar deputies to receive the tribute, the Russian rulers were required to lead the horse of the khan's representative by the bridle, and feed him with oats from their own cap of state. The grand-prince of Vladimir continued to be considered as the head of the Russian nation, and this dignity was disputed both by arms and by intrigues at the court of the khans, who fomented these dissensions as favourable to the stability of their own supremacy. In 1320 the reigning prince Mikhail was even put to death at the Golden Horde, on a charge of treason brought against him by his cousin Youri, who was nominated his successor, and removed the seat of government from Vladimir to Moscow; while the principality of Kiew was finally extinguished (1321) by the Duke of Lithuania, who conquered and annexed it to his own dominions. In the mean time Novgorod (which in 1276 had joined the Hanseatic league) had risen in commercial importance till its inhabitants had numbered 400,000; and its vast wealth and importance were attested by the well-known proverb, 'Who can resist God and Novgorod the Great!' But the remainder of Russia continued to be held in hopeless bondage, till the termination of the direct line of Batu (1361) by the death of Berdi-Bek Khan, gave rise to disputes for the throne of Kapchak among the collateral branches, and the discord of their oppressors encouraged the Russians to resistance. In 1380 Temnik-Mami, one of the competitors, was overthrown in a great battle on the Don by Demetrius IV., thence surnamed Donski; but this victory, though celebrated by all Russian writers as the commencement of freedom, produced no permanent effect. Moscow was burnt by Tokatmish-Khan in 1382, and Demetrius was forced to sue for pardon and peace. But the unsuccessful wars of Tokatmish t the mighty Timur, who twice (1389, 1395) invaded sia, gave a fatal blow to the power of Kapchak; and reigns of Vassili or Basil II. (1389-1425), and Basil III. 425-62) were a period of incessant warfare between the Russians and Tartars, who strove to maintain their domination. In 1441 Moscow was a second time destroyed b khan of Casan, but the Tartars were now still fur- r weakened by their divisions into several separate and icting khanates, and Ivan or John III. (1462-1505) at ast succeeded in shaking off the last vestiges of dependence n the Golden Horde, which was finally dissolved in 1480.

With the reign of this prince, who married Sophia, the e of the last Greek emperor, a new epoch commences the history of Russia. He defeated the Poles and Lithuanians, reduced the Tartars of Casan to tribute, and reunited under his authority most of the minor Russian principalities; but his capture of Novgorod (1475), and the exactions which he levied on the merchants and ci- s, gave a death-blow to the commerce of that famous ium. The embassies of the European powers, Ger- y, Poland, Venice, the Holy See, &c., were now first at Moscow; and though the character of Ivan is sul- by the cruel despotism of his internal administration, he is justly entitled to rank as the founder of the Russian e, the power and splendour of which date from him. was succeeded by his son by Sophia, Basil IV. (1505-33), who prosecuted the scheme of aggrandisement commenced by his father, and completed the reunion of all the Russian states by the conquest of the principality of Severia; but great part of his reign was occupied by bloody and indecisive wars with Poland, terminated by a peace (1523), with little advantage on either side. The Tartars of the Crimea, incited by the Poles, committed fearful ravages throughout Russia in 1510; and in 1520 their khan advanced to Moscow, which he spared only r se of tribute; and all the efforts of Basil failed to the subjugation of the Tartars of Casan, who de- (1524) an army of 150,000 Russians on the Volga, compelled another force, commanded by thirty Vaivodes 30), to raise the siege of their capital with loss and dis- e. His successor Ivan IV., Vasilovitch, surnamed the Terrible (1533-84), was not four years old at the death of his father. The tyranny and maladministration of the regent Schuiski occasioned disturbances during his minority, and the Crimean khan made in 1541 an unsuccessful attempt to reassert the supremacy of his nation in Russia; but in 1543 Ivan assumed the reins of government, punished the obnoxious minister with death, and was crowned (1545) by the title of czar,* which he substituted for that of Ve Knez. The first acts of his reign were the institu- the corps of Strelitzes (archers), the first regular of Russia; and the reform of jurisprudence by the cation of a regular code of laws named Youdebnik; but was unsuccessful in his efforts to procure (by an embassy to Charles V. in 1547) artisans and engineers from Germany for the instruction of his subjects. In 1552 he took Casan by storm, with a dreadful slaughter of the inhabitants. Astrakhan shared the same fate two years later; and the voluntary adhesion of the Don Cossacks (1549) secured to Russia the services of those active and warlike auxiliaries. In 1553 the English trade through Archangel was first opened; but the long wars which Ivan waged with Sweden and Poland for the possession of Livonia produced no successful result; and after the death (1563) of his consort Anastasia he became cruel and capricious, and alienated the nobles and people by the savage barbarity of his actions. In 1565 he consummated the ruin of Novgorod by the massacre of 25,000 of its inhabitants, on suspicion of correspondence with Poland; but the Poles formed an alliance with the Tartars, who took Moscow for the last time in 1571, and pillaged and burnt it, 100,000 persons perishing in the conflagration. The continued ill success of the war in Livonia forced Ivan to obtain peace (1578) through the mediation of Pope Gregory XIII., by the cession of the disputed provinces on the Baltic. The acquisition in 1581 of Siberia, which had been invaded seven years earlier by the Cossack Yermak, compensated in some measure for this loss; and the advance of civilization is marked by the introduction, about this period, of the art of printing, and of several branches of manufacture. But the ferocity of Ivan increased with his years: his eldest son perished in 1584 by a blow from the hand of his father, and Ivan himself died the same year. Though execrated by his subjects as a remorseless and sanguinary tyrant, he had raised the country by his energetic policy to a hitherto unexampled pitch of prosperity; but his eldest and surviving son and successor, Feodor or Theodore (1584-91), was a prince of such natural imbecility that the reins of government were left entirely in the hands of his brother-in-law and minister Boris Godoonoff; and the only events of his reign were the erection of a patriarchate for Russia (1589) independent of the see of Constantinople, and a short war with Sweden (1590-95), which terminated in the acquisition of Ingria and Carelia by the peace of Teusina. Feodor died childless in 1598; and his only brother Demetrius having (as was supposed) been previously murdered by the contrivance of Boris, the male line of the house of Rurik, which had ruled under fifty-six sovereigns for 736 years, became finally extinct. [GODOONOFF.]

Boris was now placed on the throne by the clergy and nobles, and commenced his reign (1598-1605) by the emancipation of the serfs and other salutary measures; but he soon degenerated into an arbitrary and cruel tyrant, and at length lost his throne and life in a contest with an adventurer who declared himself to be the lost Demetrius, and whose pretensions were supported by Poland. The real history of this person has never been satisfactorily ascertained, and many writers consider his claims to have been well founded; but after ruling scarcely a year, he perished (1606) in a popular revolt headed by a boyar named Basil Schuiski, who thereupon became czar. But a second false Demetrius speedily started up. The Poles and Swedes, who each aspired to seat a prince of their own nation on the throne, invaded the country, and were supported by various factions among the nobles, and for seven years (1606-13) Russia became the prey of desolating anarchy and civil war. The Swedes occupied Kexholm and Novgorod, and the Polish prince Ladislas, after taking Smolensk, advanced to Moscow, and sent Schuiski prisoner to Warsaw (1610). But the prospect of the dismemberment of their country roused the national spirit of the Russians; the Poles were driven from Moscow (1613) after a sanguinary battle; and in the following year Michael Romanof, a descendant by females from the house of Rurik, was called to the throne with a unanimity among all orders in the state, which the sense of imminent danger alone could produce.

The accession of the line of Romanof gives a new character to the history of Russia, which henceforward, from being regarded as a barbarous and semi-Asiatic power, begins to assume its proper rank among European States. The long reign of Michael (1613-45) afforded him time both for the consolidation of his own power and the restoration of his dominions from the depression caused by the late calamities; but he was obliged to purchase the peace of Stolbova from Sweden (1617) by the cession of Ingria and Carelia, including the whole Baltic coast of Russia, which thus retained only the single port of Archangel in Europe, and to resign Smolensk to Poland as the price of a fourteen years' truce (1618-32), a sacrifice which was confirmed, after a vain attempt to recover it by arms, by the peace of Viasma in 1634. But the internal administration of Michael was more fortunate than his wars. Though compelled by the boyars to re-establish the slavery of the peasants, he succeeded in a great measure in redressing the abuses which the preceding anarchy had occasioned; and he gave a fresh impulse to trade by the conclusion of commercial treaties with England (1623) and with France (1629). The minority of his son Alexis (1645-76) was disturbed by a dangerous revolt arising from the arrogance and tyranny of the regent Morouzof; but the removal of the obnoxious minister restored order, and Alexis, on assuming the reins of power in 1648, became an unsuccessful candidate for the Polish crown against John Casimir. This rejection deeply chagrined him, and he eagerly embraced the opportunity of revenge which was afforded by the offer of the revolted Ukraine Cossacks (1654) to put themselves under his protection. The Poles, distracted by civil war, were unable to make head against the Russians, who recovered, by the truce of Vilna (1656), Smolensk and all the other cessions of the last reign. A short war with Sweden was concluded by the peace of Cardis (1661) without any change of territory. But the contest with Poland, which had re-commenced in 1658, was continued with increasing success till 1667, when the truce of Andrussow (converted into a permanent peace in 1686) gave to Russia Tchernigow, Kiew, and the Ukraine, with the protectorate of the Dnieper Cossacks. But in the mean time the internal peace was disturbed by seditions arising from the debasement of the coinage, and from the deposition (1666) of the patriarch Nikon, whom the lower orders regarded as a saint; and in 1667 the dismemberment of the empire was threatened by a revolt of the Don Cossacks under a chief named Stenko Razin, who, by proclaiming liberty to the serfs, attracted to his standard an army of 200,000 men, by the aid of which he captured Astrakhan, and assumed the style of an independent sovereign; but he was at length overpowered and put to death, with great numbers of his followers. The last years of the reign of Alexis were devoted to internal improvements and the advancement of civilization. Numerous foreigners, particularly Scotch and Germans, were attracted to Russia, where they introduced the arts and manufactures of their own countries; and the publication of a revised code of laws gave a settled character to the national jurisprudence. Alexis died in 1676, at the age of 47, leaving several children by his two wives. The short reign of his eldest son Feodor (1676-82) was remarkable only for the first war between Russia and the Porte (1678-82), which ended in the final cession of Ukraine to the former; and for the destruction at Moscow of all the charters and muniments of the nobility, who thenceforward took precedence according to military rank. Feodor left no issue, and at his death, Ivan and Peter, both sons of Alexis, but by different wives, were placed jointly on the throne, under the guardianship of Sophia, the sister of the former. But the intrigues of this ambitious princess, who aspired to the sole exercise of authority in her own person, gave rise to sanguinary tumults among the strelitzes. The discontent of the nation was excited by the total failure of two expeditions (1687 and 1689) against the Crim Tartars; and the attempts of Sophia to exclude Peter from all share in the government at length brought on a revolution (1689) in favour of the latter. Sophia was sent to a monastery, and Ivan, whose weakness of mind and body unfitted him for rule, abdicated in favour of Peter, who ascended the throne as sole sovereign.

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* This change is often erroneously attributed to his grandfather, the former Ivan Vasilovitch.

The genius of this future regenerator of Russia had been cultivated by the instruction of a Genevese named Le Fort, who had been his tutor since 1684, and the energy of his mind speedily developed itself in action. His first care was the reform of the army, and having succeeded in raising and disciplining some regiments in the European manner, he attacked and took Azof from the Turks in 1694, being further aided by a flotilla which he built on the Don, and which was the first Russian navy. In 1697 he however quitted his dominions, and travelled for nearly two years in England, Holland, &c., in order to acquaint himself with mechanics and ship-building, and to engage artisans and engineers for his service; and a sanguinary revolt of the strelitzes, in favour of Sophia, having occurred during his absence, the corps were summarily abolished at his return, and replaced by regular troops. The same year (1698) he founded the first Russian order of knighthood, that of St. Andrew; and the cession of Azof by the Porte at the peace of Carlowitz (1699) at length gave him a port on the Black Sea. His next aim was to acquire a territory on the Baltic, and with this view he joined the Northern League with Denmark and Poland against Sweden; and though his raw levies were signally defeated at Narva (1700) by Charles XII., he succeeded during the next two years in occupying Ingria and Carelia, while the Swedes were engaged in the Polish war; and his new capital city of Petersburg was founded on this territory (1703) at the mouth of the Neva. Narva and Dorpat in Livonia (1704), and Mittau in Courland (1705), were successively taken; and the victory of Kalish over the Swedes (1706) gave confidence to the Russian soldiery. The internal reforms were not suspended during these warlike operations. Schools, printing-presses, manufactories, and hospitals were everywhere established, and the university of Moscow was founded in 1705; while the overgrown power of the clergy was curtailed by the abolition of the patriarchate, the czar declaring himself head of the church. Charles XII., who had dethroned Frederic Augustus in Poland, and was now at the summit of his power, determined to crush the rising strength of Russia, which he invaded (1708) through the Ukraine, and was joined by the Cossack ataman Mazeppa; but he sustained an irreparable defeat from Peter (July 8, 1709) at Poltava; all his army was either destroyed or taken, and the king himself fled into Turkey. The Russian arms were now in the ascendant; Wiborg, Reval, Riga, with all Esthonia and Livonia, fell into their hands; and Frederic Augustus remounted the throne of Poland, in which kingdom Russian influence continued from that time paramount. But a war (1710) with Turkey, arising from the shelter afforded by that power to Charles, had a disastrous result; the Russians were surrounded on the Pruth, and Peter was compelled to purchase the peace of Falczy (1711) by the restoration of Azof and other humiliating concessions. The domestic administration in church and state was provided for by the erection (1711) of the Directing Senate, the supreme civil tribunal, and some years after (1724) of the Synod for ecclesiastical affairs; but both were under the direct control of the czar, who exercised despotic sway by means of his army, and deprived the nobility of all their power. In 1716-17 he again travelled through Holland and Denmark, and visited France, where he concluded an alliance with Louis XV. But his return was marked by a domestic tragedy; his son Alexis, who had previously offended him by his weak and vicious course of life, was tried on pretence of conspiracy, and condemned, but died, perhaps from natural causes, in prison. The Swedish war, which had languished after the death of Charles XII. in 1718, was at length concluded (1721) by the peace of Nystadt. Russia acquired Wiborg, Ingria, Carelia, Esthonia, and Livonia, and became thenceforward the great Northern power in place of Sweden; and Peter exchanged the title of czar for that of *emperor and autocrator of all the Russias*, which his successors have ever since borne. In 1723 he availed himself of the distracted state of Persia to seize the provinces on the Caspian, which necessity compelled Shah Tahmasp to cede to him; but this was his last exploit. He died Jan. 28, 1725, aged 53. In 36 years he had raised Russia from a semi-barbarous state to a pitch of military strength and political importance which placed her on a level with the first powers of Europe. Her army, her navy, her commerce, and her legislature were all created by his genius; and though his great qualities were too often stained by acts of cruelty and tyranny, he must be pronounced to have justly merited the epithets of *the Great*, and the *Father of his Country*, conferred on his memory by the unanimous voice of the nation.

In obedience to the last commands of Peter, his widow Catherine, formerly a Livonian peasant-girl, was proclaimed empress: but her short reign (1725-7), and that of her successor Peter II., grandson of Peter the Great, and son of the unfortunate Alexis (1727-30), were (except the conclusion of a commercial treaty with China in 1727) almost barren of events, and remarkable only for the ascendency, under Catherine, of Prince Menzikoff, and under Peter, of the Dolgoruki family. On the death of Peter II., Anne, daughter of Ivan, the elder brother of Petor the Great, was called to the throne (1730-40) by the influence of the Dolgoruki faction, on signing an agreement which limited the imperial power in favour of the nobility: but this compulsory act was almost immediately cancelled under the advice of the Chancellor Ostermann, and the Dolgorukis were disgraced nd exiled to Siberia. The election to the Polish crown in 733 was decided in favour of Frederic Augustus II., by the resence and peremptory interference of a Russian army: ıd though the Persian provinces seized by Peter the Great ere restored (1735) by a convention with Nadir-Kouli, the efeat of the Pruth was amply avenged by a war (1736-9) n alliance with Austria) against the Porte. Crim-Tartary as overrun by Marshal Munnich; Azof, Oczakow, and hoczim taken, and Moldavia occupied; but the peace of elgrade (1739), which was necessitated by the losses of ustria, restored all these conquests except Azof. Anne queathed the succession, under the regency of her faurite Biron, to her grand-nephew Ivan (1740-1), a child o months old, son of her niece Anne of Mecklenburg, Duke Antony of Brunswick-Bevern. Biron was speedily erthrown by a cabal headed by the parents of the infant nperor, who themselves assumed the guardianship; but e discontent of the Russians at the influence of the foreign inisters introduced by Anne at length broke out in revolt; ıd Elizabeth, daughter of Peter the Great by Catherine, ed to the throne (1740-62). Ostermann and Mun- were sent to Siberia, and the ministry vested in Beshef-Riumin, who continued at the head of affairs till 7; while a war with Sweden, which had commenced '41, ended (1743) in the acquisition of part of Finland by ussia. The alliance concluded with Maria Theresa (1747) the war of the Austrian Succession, and the consequent pearance on the Rhine of 36,000 Russian auxiliaries under epnin, gave Russia, for the first time, a direct participation the politics of Western Europe; and in the Seven Years' ar, a large Russian force, acting as allies of Austria, inded Prussia, of which they held possession from 1757 to '62: the victories of Gross-Jagersdorff (1757) and of Kunorff (1759) over Frederic the Great, established the wn of Russian arms, and Berlin fell into their hands in ; while an army of observation was maintained from '58 in Poland, then a prey to anarchy and confusion. lizabeth died Jan. 1762, regretted by her subjects, to whom e had endeared herself by the mildness of her domestic lministration; and was succeeded by her nephew, Peter I., duke of Holstein-Gottorp. The first act of this prince as to abandon the Austrian alliance, and conclude peace ith Prussia: he abolished the torture in criminal prosses, and issued judicious regulations for the protection of ommerce; but he speedily disgusted his subjects by the sh innovations which he attempted to introduce into the and the church, and the public discontent was secretly mented by his consort, Catharina of Anhalt-Zerbst, a rincess of a masculine understanding, who had long been t variance with him. After a reign of six months, he was ethroned (July, 1762) by a conspiracy, and died in prison week afterwards, as is generally supposed by violence; e Catharina II. was called to the throne by the unanis voice of the army and the people.

The accession of this ambitious and unscrupulous princess 1762-96) gave a fresh impulse to Russian policy, which rom this time assumed the steadily aggressive character hich it has ever since maintained. On the vacancy of the olish throne, in 1764, a Russian army dictated the election f Stanislaus Poniatowski, a former paramour of Catherine: Poland continued distracted by civil war, and the com- of the Porte at the continued occupation of the y by Russian troops led to a Turkish war (1768-74), which the Russian arms were signally triumphant. A ussian fleet appeared for the first time (1770) in the Mediterranean, and destroyed the Turkish navy at Tchesmé; the nd forces subdued Crim-Tartary, Moldavia, and Wallachia; he Danube was crossed for the first time in 1773, and the sses of the Porte compelled her, by the treaty of Kutchuk-Kainardji (1774), to acknowledge the Crim-Tartars independent, and to cede to Russia an extensive tract of territory. n the mean time the first partition of Poland (1772) had n place, which gave Polotsk and Moghilew to Russia; dangerous revolt of the Cossack Pugatchef, who per- Peter III., was quelled by his capture and death in . The internal administration was placed on a new ooting by the division of the empire (1776) into forty-three overnments with separate jurisdictions, and by the gradual lgation (1775-83) of a new code of laws; the deserts colonized, and 200 new towns built by Potemkin, who bsolute minister from 1778 to 1791. In the mean time chains of Poland were daily riveted tighter; and the pposition of England to the avowed project of erecting a new Greek empire at Constantinople, on the ruins of the Turkish power, is generally supposed to have given rise to the famous Armed Neutrality (1780), in which all the northern powers combined with Russia to resist the right of maritime search claimed by Great Britain. Crim-Tartary was seized (1783) and incorporated with Russia; but this encroachment, though the Porte was compelled at the time to acquiesce, led eventually to the second Turkish war (1787-92), memorable for the sanguinary triumphs of Potemkin and Suwarrow: Choczim, Oczakow, Bender, and Ismail were successively taken with fearful slaughter, and the peace of Jassy (1792) established the Dniester as the boundary of Turkey and Russia. A short war with Sweden (1788-90), in which the Swedes threatened Petersburg, and gained a great naval victory at Svenkasund, had in the mean time been concluded by the peace of Werela, without territorial change. The outbreak of the French revolution produced a change in the disposition of Russia towards England, with whom an alliance and a commercial treaty were concluded in 1793; but no active part was taken against France, as the attention of the empress was directed towards Poland, by the second partition of which (1793) Russia gained Podolia and the Ukraine, with half Lithuania and Volhynia. Warsaw was garrisoned by the Russians, but a fierce struggle ensued (1794) on the general revolt of the Poles under Kosciusko and Madalinski; till the storm of Praga by Suwarrow, in which 20,000 Poles were slaughtered, finally crushed all resistance, and the third and last partition of the kingdom took place the next year, by which the nationality of Poland was extinguished, while Russia gained Courland with the rest of Lithuania and Volhynia, in addition to her former acquisitions.

Catharine II. died the year after the accomplishment of this favourite object of her policy, and was succeeded by her son Paul (1796-1801), a weak and fickle prince. He joined (1798) the second grand coalition against France; and the Russian auxiliaries, under Suwarrow and Korsakow, covered themselves with glory in Italy and Switzerland in the campaign of 1799: but Paul soon capriciously abandoned his allies, concluded peace with Bonaparte (then first consul), and, in 1800, put himself at the head of the Convention of the North, a union of the northern states, on the principle of the armed neutrality, against the British maritime supremacy. A war with England was impending, when Paul, whose frantic tyranny (verging on madness) had made him odious to his subjects, was murdered in his palace (1801) by a band of conspirators.

His son and successor Alexander (1801-25) immediately effected a pacification with England, and disbanded a force of 45,000 Cossacks which his father had assembled at Orenberg, with the wild design of marching overland to India: the relations with France continued however peaceful till 1805; but Alexander refused to acknowledge Napoleon as emperor, and joining the Austrian alliance against him, was personally present at the defeat of Austerlitz. In 1806 the renewed alliance of the Porte with France was made the pretext of a new Turkish war (1806-12), and Moldavia and Wallachia were occupied; but the successive victories of Eylau and Friedland gained by the French (1807), led to the famous conferences between Alexander and Napoleon, the result of which was the peace of Tilsit. Russia joined the 'Continental System' of Napoleon, and became an ally of France; declaring war (1808) against England and Sweden, the latter of whom was forced to cede, by the peace of Frederiksham (1809), all Finland, East Bothnia, and Aland. The war with the Porte, which had been suffered to languish, was resumed with fresh vigour in the bloody but indecisive campaigns of 1810-11-12; but the injury which the 'Continental System' inflicted on Russian commerce was becoming insupportable, and the refusal of Alexander to enforce it at length led to a rupture with France (1812). Alliances were now formed with England and Sweden, and the peace of Bucharest with the Porte, concluded through the mediation of the British minister, extended the Russian frontier to the Pruth. In the autumn of 1812, Napoleon invaded Russia with 500,000 men, defeated Kutusoff at Borodino, and advanced to Moscow; but the country was everywhere laid waste, and the conflagration of the capital itself by the governor Rostopchin compelled the French to retreat in the midst of a winter of unexampled rigour, pursued by the Russians: nine-tenths of their vast host either perished or were taken prisoners, and Napoleon himself escaped only by deserting his army.

A powerful Russian force continued to take part in the campaigns of 1813-14 against France, and Alexander entered Paris in triumph. By the congress of Vienna (1815), Warsaw and a large territory, under the name of the kingdom of Poland, were annexed to the crown of Russia, but with a separate administration and free press. A desultory war with Persia (1804-13) had been concluded by the peace of Goolistan, Persia ceding most of her Caucasian provinces, and giving up her claims on Georgia.

The military power and political influence of Russia were now almost paramount on the Continent; and after the final downfal of Napoleon, in 1815, she became the head of the 'Holy Alliance,' entered into by herself, Austria, Prussia, and France, for the suppression of revolutionary principles. The remainder of the reign of Alexander was peaceful, and occupied chiefly in reforms of the internal government; while the long line of frontier was strengthened by the formation of military colonies, and the welfare of the subjects was promoted by the frequent progresses of the sovereign through the interior provinces. In one of these tours of inspection Alexander died at Taganrog, on the Don, aged forty-eight (Dec. 1825); and, leaving no issue, was succeeded by his brother Nicholas, the third son of Paul, the second brother, Constantine, having previously renounced the succession. This change in the succession occasioned some military tumults, which were not quelled without bloodshed. In 1826 a dispute respecting boundaries led to a fresh war with Persia, which continued till 1828, when the progress of the Russians compelled Persia to give up Erivan and the country as far as the Araxes, as the price of the peace of Turkmanchai. The Greek revolutionary war was now raging, and the treaty of London was signed (July, 1827) by Russia, France, and England, for the settlement of the question; but the refusal of the Porte to accede to the terms dictated to her produced the destruction of the Turkish fleet by the allied squadrons at Navarino; and in 1828 a Russian army invaded Turkey, and though repulsed from before Shumla in the first campaign, succeeded in crossing the Balkan (1829), and occupied Adrianople, where a treaty was concluded, by which Russia acquired numerous frontier fortresses on the Black Sea, and the protectorate of Moldavia and Wallachia. A general insurrection of the Poles (Nov., 1830), who were goaded by the tyranny of their viceroy the grand-duke Constantine, and by repeated infractions of their constitution, was crushed, after a campaign of frightful devastation and bloodshed, by the capture of Warsaw, Sept., 1831: many thousand Poles of all ranks were sent to Siberia; the kingdom was incorporated with Russia, and has ever since been governed as a conquered province. The relations with the Porte assumed a new form in 1833, from the application of the sultan for aid to check the advance of the rebel pasha of Egypt: an auxiliary force was sent to Constantinople, and terms imposed on the pasha; but this service was repaid by the treaty of Unkiar-Skelessi, binding the Porte to have recourse to no other power for assistance, and to close the Dardanelles against all foreign ships of war. The absolute ascendency thus acquired in the divan was viewed with great jealousy by France and England; but their complaints were disregarded by the Russian cabinet, which, shortly after the accession of Mohammed Shah to the Persian throne, in 1834, succeeded in obtaining a similar paramount influence, to the exclusion of British interests, in the councils of that nation. These proceedings excited in England a strong popular feeling of hostility towards Russia, which was further augmented by the seizure, in 1836, of a British merchantman on the coast of Circassia, where a fierce guerilla warfare with the natives had been for some years carried on, the Russians claiming the country as ceded to them by the peace of Adrianople. The march against Herat (1838) of a Persian army, directed by Russian officers, which was viewed as preliminary to the invasion of the Anglo-Indian empire, brought the conflicting relations apparently to the verge of a rupture: but the apprehensions of the English cabinet were tranquillised by the repulse of the Persians, and the subsequent conquest of Afghanistan by an army from India; and the Russian schemes of aggrandisement in this quarter have since received a further check from the failure of a formidable expedition directed (1840) against the predatory Uzbek state of Khiva. Such is the present political aspect of Russia: with two formidable fleets in the Baltic and Black seas, and a standing army amounting (at least nominally) to upwards of 800,000, she presents a formidable armed front to Western Europe. The events of the last ten years have rendered her almost absolute arbitress of the destinies of her antient opponents, the two great Moslem powers of Turkey and Persia; and her interests are everywhere watched and promoted by the exertions of her diplomatic service, the numbers and organization of which far exceed that of any other nation. But on the other hand, the absolute despotism which pervades every branch of the government, renders the efficiency of this vast power almost entirely dependent on the personal character and energy of the reigning sovereign: the Polish nation and many of the subject tribes are retained in unwilling obedience only by military coercion; and the extensive disaffection understood to prevail among the nobility (whose former privileges and power have been wholly annihilated), with the desire for free institutions, which must necessarily result from the gradual diffusion of knowledge among the lower orders, will probably lead, at no distant period, to important changes in the constitution and government.

Government and Administration.—The actual political organization of Russia is as follows:—

The emperor is as absolute as in the times of Ivan Vasilovitch the Terrible. However this despotism may be modified by the progress of civilization, the actions of the emperor Paul I. prove, that should the monarch of Russia wish to indulge himself in any freaks of tyranny even bordering on insanity, there is no power to prevent him from doing so. Several classes of the inhabitants enjoy certain privileges and immunities, although it is quite superfluous to add that these liberties have no other guarantee than the pleasure of the monarch, who may abolish them just as he granted them. A remarkable feature in the political organization of Russia is, that no one has of right any rank unless such as he obtains by filling a civil or military office. The offices, military, naval, and civil, are divided into the following fourteen grades:—

	Military.	Naval.	Civil.
1	Field-Marshal	General Admiral	Chancellor
2	Full General	Full Admiral	Actual Privy-Councillor
3	Lt.-General	Vice-Admiral	Privy-Councillor
4	Major-General	Rear-Admiral	Actual Councillor of State
5	Brigadier (now abolished)	Commodore	Councillor of State
6	Colonel	First Captain	Councillor of College
7	Lt.-Colonel	Second Captain	Councillor of the Court or Aulic Councillor
8	Major	Capt.-Lieutenant	Assessor of College
9	Captain	Lieutenant	Honorary Councillor
10	Second Capt.		SecretaryofCollege
11			
12	Lieutenant	Midshipman	Secretary
13	Under-Lieut.		
14	Ensign		Registrar of College.

Many of these grades belong to certain offices, and are lost with the loss of office, which is particularly the case with those that are elective. The inhabitants of Russia are divided into the following classes; the clergy—the nobility, the merchants and burghers—the peasants.

The clergy is composed of the monastic or regular clergy, and the secular clergy. All the higher preferments of the church are held exclusively by the first, the secular or parish clergy (the members of which, according to the discipline of the Greek church, must be married) have no higher preferment than that of a *protoyerey* or *protopapa*, who has the superintendence over a certain number of parishes. The children of the clergy generally follow the voctaion of their parents, so that it is a very rare case in Russia to see a clergyman who is not descended from the clerical class. Many of these children however enter different branches of the public service, particularly the civil department.

The nobility is the privileged class, and in some degree the ruling class, in Russia. Till the time of Peter III it was subject to the duty of personal service, but that monarch granted, by a ukase of 18th February, 1762, to that order the following privileges:—

The nobles may enter the service of foreign powers not at ır with Russia.* A noble marrying a non-noble woman ises her to his rank; but a noblewoman marrying a per- n of an inferior condition does not lose the privileges of her der, although she does not communicate them either to r husband or children. A noble cannot be judged ex- pt by a judge belonging to his condition, and a sen- e passed against him cannot be carried into execution uout having been previously examined by the senate and nfirmed by the emperor himself. A noble is exempt from rporal punishment, and he cannot be prosecuted for a ime committed by him if ten years have elapsed without gal notice being taken of it. The nobility may establish ıy kind of manufacture and engage in commerce, but in e latter case they must inscribe themselves in one of the erchants' guilds, and pay the taxes attached to it. By a ıase of 1782, all the mineral productions found on their tates are their property, and they are the almost exclusive ndholders of the country.

The nobles have meetings for the election of local magis- ates, and they may send deputations to the emperor after ıving previously obtained a special permission for so ing. They may also deliberate at those meetings on veral local affairs. Those nobles only who enjoy a grade the military or civil service are capable of voting. The tes are either personal or by a representative. The right a personal vote belongs to those who possess 100 male rfs or 3000 dessiatines of ground.† Those who have not e required amount of property vote by a representative, ovided they possess at least five male serfs or 150 dessia- es of ground. This class of nobles elect in respect of eir collective estates one representative for every 100 serfs 3000 dessiatines of ground.

The nobles elect the following magistrates:—

For the government—1st. The chief or marshal of the bles. 2. The presidents and assessors of the criminal and vil tribunals which are courts of appeal from the district ibunals. 3. Judges of the conscientious tribunal. 4. The norary curators of the schools. 5. The members of the mmission of public victualling. 6. Deputiēs from each strict, forming a commission for examining the pedigrees the nobles. 7. A secretary of the above-mentioned com- on. The elective officers of the districts are:—1. A or marshal of the nobles. 2. The district tribunal, con- ng of a chairman, two assessors, and a secretary. 3. The ice magistrates, consisting of the captain *Ispravnick* (*i.e.* ecutive), and four assessors. There are also offices exist- g only in some particular governments, as the magistrates r settling the boundary questions between estates, &c.

The nobles are divided into two classes:—

1. Hereditary and personal. To the first class belong all obles who have inherited their rank or risen in service to e eighth grade. The personal nobles are those who have quired by their services a grade inferior to the eighth. hese latter enjoy the privileges of the order without trans- itting them to their children, and they cannot be elected certain offices.

The titled nobility, or princes, counts, and barons, have no rivileges beyond those of the other nobles. These titles are erived from Russian and foreign grants. The princes are hiefly descendants of the antient petty princes of Russia, nd some of the Lithuanian dynasty; many are of Tartar escent, as the Tartar Murzas, or nobles who were baptised, received the title of princes. In later times, many of Georgian and Imeritian nobles of the first class, called *uvadi*, or heads, have been received into the class of Rus- an princes.

2. The second order of the inhabitants of Russia is com- osed of the citizens or townsmen, *Grajdane* or *Gorodoveeye.* hey are subdivided into many classes, viz.: 1. The hono- ary citizens, *Pochetneeye Grajdane*, who are exempt from e capitation-tax, military conscription, and corporal punish- t, and have the right of being elected to municipal consist of free non-nobles, who have obtained ical honours,‡ distinguished artists, and heads of manufacturing establishments. The privilege of honorary citizenship is possessed by some of hereditary right, and is with others only personal. The children of the personal nobles are hereditary honorary citizens. The privileges of that order are forfeited either in consequence of a criminal sentence, or by engaging in some mean trade, and entering into domestic service.

The merchants are divided into three classes or guilds. The first guild, which is obliged to pay under various denominations an annual tax of 100*l.*, has a right to engage in any commercial or manufacturing enterprise without any limitation as to the amount of capital employed in it. The second guild, which pays an annual tax of 40*l.*, is subject to the following limitations:—A merchant of that guild cannot declare at the customhouse, merchandise brought in one ship-load or by land conveyance of higher value than 2000*l.*, and his foreign trade must not exceed in the course of a year the value of 12,000*l.* Should the value of his merchandise exceed that maximum, he is obliged to pay the tax of the merchant of the first guild. The merchant of the second guild cannot enter into any contract for more than 2000*l.*, nor can he keep a banking or insurance office. Both the first and second classes enjoy an exemption from the capitation-tax, military conscription, and corporal punishments. They may possess estates with serfs, provided the serfs are employed in manufactories. Their children enter the service on the same footing as those of the personal nobles, *i.e.* they can advance as officers after having served three years in an inferior grade. The merchants of the third guild, who pay an annual tax of 10*l.*, may carry on every kind of retail trade, and have manufactories, provided they employ in them no more than 32 workmen. Nobles who engage in commerce may enter one of these three guilds, according to the extent of their transactions.

Foreign merchants trading in Russia must pay the same taxes as the Russian merchants, and their commerce is subject to several limitations. They may acquire real property in places where they are settled.

The burghers, *Mieshchane*, by purchasing an annual licence, the price of which, according to the class of the town which they inhabit, varies from 1*l.* to 3*l.*, may engage in several kinds of retail trade, and have workshops, in which they may employ, besides their family, eight workmen, and by doubling the price of their licence sixteen workmen. Should they wish to increase that number, they must pass into the third guild of merchants. Those who pay no licence can engage in certain ordinary trades and have a single shop for retailing certain common goods specified under fourteen heads. The burghers are not exempted from the capitation-tax, military conscription, or corporal punishment.

The peasants constitute the lowest class of the inhabitants of Russia, and as they do not enjoy any personal privileges, they cannot (according to the expression of the ukase of the 10th March, 1813) be deprived either of honour or good name. They pay the capitation-tax and are subject to military conscription. Beside their agricultural pursuits, they are allowed to engage in handicrafts and some minor trades, as keeping inns in villages, &c. By purchasing licences they may engage in any kind of commerce, even that which is carried on by merchants of the first guild, but they do not enjoy the personal privileges of the merchants.

There are instances of serfs belonging to some noblemen possessing immense wealth, and even a great number of serfs, which they hold in the name of their master.

The peasants of Russia are divided into crown peasants, those of appanage estates, serfs of landowners, and free cultivators of land; the number of these last is however very small.

The crown peasants are those who live on the estates belonging to the crown. They pay, besides the capitation-tax, a rent for their grounds. Many villages are obliged to maintain post-horses for the government couriers and private travellers.

The crown peasants elect some of their authorities. Each commune, *Volost* (500 male individuals constitute a commune), elects every two years its chief, called head. Each commune also sends a deputy for the election of assessors who judge in causes arising among themselves, or between them and other classes. These assessors may be chosen from among the peasants themselves or other classes. Causes between crown peasants themselves are decided by the judge of the district with the above-mentioned assessors: but when other parties are concerned, the causes are decided by the same judge with an assessor of the peasants and another of the nobles. The crown peasants may pass into the class of burghers and merchants.

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* A ukase of 1831 prohibits all Russian subjects, except those who are em- oyed on diplomatic service, from educating their children from ten to ghteen years of age abroad. All children educated in contravention to the kase are declared incapable of holding office in Russia.

† A dessiatine is about three English acres.

‡ Academical honours entitle the individual who has obtained them to re- eive a corresponding grade on entering the civil service. Thus a student ho has completed a course of studies at a university is received into the vil service with the 12th grade, a candidate with the 10th, a master with the th, and a doctor with the 9th.

The *Odnodvortzi*, or single householders, are descendants of military men who received grants of land for their services. They formerly constituted a kind of minor nobility, and could possess serfs, a privilege which those who are in the actual enjoyment of it retain even now, but they are prohibited from making new acquisitions, except from persons belonging to their own class. They have also some few other privileges over the common crown peasants.

Many estates peopled with crown peasants have been, according to a ukase of Peter the Great, ceded to particular individuals on condition of establishing manufactories. These peasants, called adscripti (*pripisnuye*), work in manufactories on certain fixed terms. The owners of the manufactories pay all taxes due from these peasants, who are likewise exempted from military conscription. The condition of the peasants of the appanage estates (those reserved for the maintenance of the imperial family) differs little from that of the crown peasants.

The landowner's peasants, or serfs, are complete slaves. Their master can inflict on them such punishment as he chooses, but he is not permitted to kill, to starve to death, or to maim his serf. A serf cannot contract marriage without the permission of the master. The predial serf cannot be sold without the ground to which he is attached, but the domestic serf may be sold like any other chattel. A ukase of 1808 however prohibits the sale of serfs at fairs or by auction, or as substitutes for recruits. An accusation of a serf against his master, except in cases of high treason, is not admitted, and he who proffers such a charge is liable to punishment.

The free peasants, a class whose existence began under the emperor Alexander, are subject to the capitation-tax and military conscription, but they are free in all other respects.

A great number of German colonists have settled in Russia at different times. They are exempt from all taxes for ten years after their settling, and from military conscription entirely.

Having described the various classes of the inhabitants of Russia, we must say a few words on its administration.

The principal authority is the council of the empire, presided over either by the monarch or by a member specially appointed. It is divided into four departments: 1, the legislative; 2, the military (which comprises also the navy); 3, that of civil and ecclesiastical affairs; and 4, the financial. Each of these departments has a secretary of state, and they deliberate either separately, or together, which is called the general assembly of the council. The affairs which are decided by a majority of votes, are submitted to the approbation of the emperor. To the council of the empire are attached—the commission of petitions for examining and deciding on all petitions addressed to the emperor, and an imperial chancery.

The senate, or, as it is officially called, the Directing Senate (*Pravitelstvooyooshehey Senat*), was established by a ukase of Peter the Great, dated February 22, 1711, and its organization was determined by the ukases of 1772 and 1802. Its powers and duties are comprehended under the following heads:—

1. It is the supreme tribunal for all judicial cases.
2. Its authority is limited only by that of the monarch.
3. It is presided over by the emperor in person.
4. The ukases of the senate are binding like those of the emperor, who alone can prevent their execution.
5. Every imperial ukase obtained by private persons, except such as may require secrecy, must be presented to the senate by those by whom they have been obtained.
6. It is the duty of every senator to represent to his colleagues every matter relating to the state and breach of law which may come under his cognizance.

The senate is divided into eight departments, of which the 1st superintends the general affairs of the country; the 2nd, 3rd, and 4th try civil cases; and the 5th, criminal cases: these are all at Petersburg. The 6th, which also tries criminal cases, and the 7th and 8th, which try civil cases, are at Moscow. Each of these departments has a number of governments or provinces, from the courts of which it hears appeals. Judgment is given by a majority of votes, which must consist of two-thirds of the whole number, or of the number present. In case the required majority cannot be obtained, the cause is decided in the general assembly of the senate, where all the departments vote together. Causes are not publicly argued be[illegible] the senate or before any other Russian tribunal. A sta[illegible] of the case of each party is made by the secretary, and [illegible]municated to the party, who signs it as correct. The[illegible] statements are then read by the secretary, in the presence of the parties, to the court, which pronounces judgment. In the antient Polish provinces, where the Polish laws were retained, causes were publicly argued by advocates, but these laws have been recently abolished and those of Russia introduced. A separate department called Heroldia is attached to the senate: its office is to examine and confirm the claims to nobility, and to superintend the advancement and rewards of civil officers throughout the empire.

The synod, or, as it is officially called, the most holy directing synod, is the supreme administrative and judicial c[illegible] for all ecclesiastical affairs of the Greek religion. Its [illegible]sions are subject to the control of the emperor as h[illegible] the church.

The administration of the country is conducted by following ministries:—

1. Ministry of the Imperial household.
2. Ministry of foreign affairs.
3. Ministry of interior affairs, or home department.
4. Ministry of war.
5. Ministry of marine.
6. Ministry of national education, to which is attached the administration of the ecclesiastical affairs of those sects which do not belong to the Russian church.
7. Ministry of finance.
8. Ministry of justice.
9. The board of control of the empire, which audits the accounts of all moneys expended for the public service.
10. Ministry of the post department.
11. Ministry of the general direction of land and water communication.

The governments or provinces are organised in the following manner:—The head of the administration of a province is the civil governor, to whose department belo[illegible] all the affairs of the province except judicial cases; but alth[illegible] he cannot decide judicial cases, he may compel the [illegible] to hasten the decision of an affair. No criminal [illegible] can be executed without his confirmation. There is [illegible] one military governor for two, three, or four prov[illegible] whom all civil and administrative affairs are referred.

The vice-governor is the head of the financial department of the province, and he supplies the place of the governor in case of his absence.

The government procurator is appointed to observe that the laws are strictly fulfilled, and he may in case of irregularity suspend the execution of a judicial sentence and report the case to the minister of justice. On [illegible] of his extensive powers, he is called the eye of the [illegible]

The tribunals or courts of appeal try civil and [illegible] cases, and the members of them are, as we have said, [illegible] by the nobles.

The conscientious tribunal (*soriestneey sud*) is composed of a chairman and two assessors elected from [illegible] nobles, two assessors from the merchants, and two [illegible] the peasants. This court hears those criminal cases w[illegible] the crime was committed more from a concurrence of unfortunate circumstances than from malice; consequently all crimes committed by minors and lunatics, as well as cases of witchcraft, because they are supposed to ori[illegible] from folly, ignorance, and delusion, are within its juri[illegible]tion. Parents may also apply to this court for relief [illegible] the misconduct of their children. In civil cases i[illegible]vours to reconcile the parties who apply to it. But the [illegible] important duty of the conscientious tribunal is to pr[illegible] illegal imprisonment. If any individual addresses a [illegible]tion to it, stating that he has been kept in jail three [illegible] without being informed of the charge on which he [illegible] arrested, and without having been examined, the trib[illegible] is obliged immediately to issue an order that the person [illegible]tained shall be brought before it, with a declaration of the reasons for which he was imprisoned and not examined, and this order must be obeyed within 24 hours under a heavy penalty. The jurisdiction of the court does not however apply to cases of offence against the Imperial person, high treason, murder, theft, and robbery.

ard of Public Charities is composed of the gover-
e province and some principal magistrates; its
iciently denotes its duties. There is a medical
ach government.

horities of the district have been enumerated in
the privileges of the class of nobles from whence
orities are elected; we must only add that there is
listrict a council called the tutelage of the nobles,
the trustee of all minors of that class. It is com-
he marshal of the nobles and of the members of
l tribunal of the district.

vns have their separate jurisdiction, composed of
naster and ratmans (from the German rathmän-
lmen), who are elected from the merchants and
of the town. There is also a council of tutelage
of the burgher class.

a general outline of the political organization of
d if this organization had been effective, the country
ve been tolerably governed. It is needless to
at a despotic power will not interfere with esta-
ler, except in political cases, as it is interested in
ng that order for its own preservation; but other
vent the good working of the Russian administra-
, particularly with respect to justice and police, is
tched. One of the most mischievous defects is
ient pay of magistrates, of whom the highest, *i.e.*
receives 160*l.* a-year. It is true that many sena-
nen of property; but there are many who have
ore than their pay, which is also the case with
ty of the civil officers. Bribery is the universal
the Russian administration.

Yaroslav I. promulgated at Novgorod a code of
ntly of Teutonic origin. But the dominion of
s entirely changed the character of the laws of
roducing death, mutilation, and torture, instead
al and fines.

Ivan III. made an order for collecting into one
existing customs and ordinances, and rendering
tion complete by the necessary additions. By
an the Terrible, this code was (1550) revised and
under the name of *Sudebnik*, or judgment-
Czar Alexey Michaelovich gave orders (1640) for
a general code of laws under the name of
(Regulation). It consists of 25 chapters, and
the basis of the Russian law. Since that time
n legislation has been continued by *ukases, i.e.*
issued either in the name of the monarch him-
he senate; and their number from the 25th Jan.,
e demise of the emperor Alexander, is 30,920, in-
l kinds of statutes,* regulations, and treaties.
Great had a project for collecting the separate
into one body, and remodelling the Ulo-
49; and for that purpose he established a com-
1700, which however produced no effect. The em-
beth appointed (1754) one general and several
nmissions for the purpose of making laws 'clear,
, and adapted to the progress of the times.'

ommissions prepared three codes, relating respec-
ocedure, criminal law, and the different conditions
bitants. These codes were not however sanctioned
reme authority, and the commissions dissolved of
. Catharine II. published her celebrated instruc-
he composition of a code of laws, and appointed
nissions for that purpose. These commissions,
ned some projects of laws, were dissolved in 1774.
sion for the same object appointed by the emperor
7) had no better success. Under the reign of
, the legislative labours were again resumed (1804).
uctions were published, and several foreign law-
nominated correspondents of the legislative com-
hich received a new organization; but all these
oduced no result. These commissions cost the
rom 1754 to 1826, 5,678,935 francs, and did not
a complete collection of the existing ordinances.
he commissions began its labours anew, instead
ning what was done by preceding commissions.
erior officers of state were members of these com-
but being occupied with other affairs, they could
he necessary attention to their legislative labours,
e members were frequently changed, it was some
re new members became well acquainted with their subject. Opinions also frequently varied as to the real object of the undertaking: sometimes their labours were directed to the accomplishment of a simple collection and arrangement of the existing laws and ordinances (code de concordance), and sometimes it was contemplated to effect a reform in legislation. Immediately after his accession, the emperor Nicholas declared that a systematically arranged collection of the existing laws and ordinances should become the basis of legislation, and he transformed the legislative commission into the second section of the imperial chancery, under the presidency of the celebrated Speranski. [Speranski.] The result of this measure was a collection of all the laws and ordinances from 1649 till the death of the emperor Alexander, 1st December, 1825, which were published in 48 vols. 4to., 1827-30. It was followed in 1832-33 by a collection of the ordinances of the emperor Nicholas, from his accession to 1832, in 8 vols. 4to., and is still continued. These two collections contain 32,993 laws, from which was extracted the *Svod Zakonow* (corpus juris), published 1826-1833, 15 vols., which was declared by an imperial ukase, 31 January, 1831, to be the law of Russia wherever the provincial laws are not opposed to it, and that it should become valid from the 1st January, 1835.* This svod is a systematic arrangement of single laws, in eight parts or codes. The 1st comprehends the fundamental law of the state, the law of the imperial family, and the organization of the authorities of the state; the 2nd, the public services, *i.e.* military service and statute labour (corvée); the 3rd, the administration of the finances; the 4th, the different classes of the inhabitants; the 5th, civil law; 6th, internal administration, industry, municipalities, &c.; 7th, police; and 8th, public law. These eight codes contain 1499 chapters, and about 38,000 articles. Together with each article is indicated the ordinance from which it is taken, and its connection with other ordinances is given in notes. An historical sketch of the Russian legislation is prefixed to the work. For further information consult *Précis des Notions Historiques sur la Formation du Corps des Lois Russes*, St. Petersburg, 1833.

RUSSIAN CHURCH. The Russian church is a branch of the Eastern or Greek church, whose missionaries seem to have penetrated among the Slavonian population that inhabited the countries to the north of the Black Sea at an early period. The commercial intercourse which Cherson and other Greek colonies on the northern shores of the Black Sea maintained with the Slavonians, facilitated the diffusion of Christianity among them. The number of Slavonian converts must have been considerable towards the end of the 9th century, as the Byzantine writers, about the year 900, mention the diocese of Russia. The expeditions of the Varego Russian princes of Kiew against the Greek empire greatly contributed to the progress of Christianity. Among their subjects, the princess Olga went, in 955, to Constantinople, in order to be baptised. Her example was not followed by her son Sviutoslaf, who continued in the idolatry of his ancestors, although he did not persecute the doctrines nor prevent his mother from building churches. A popular commotion against the Christians, in 980, at Kiew, proves that their number was already sufficiently great to excite the jealousy of the pagans; and in 988, Vladimir the Great, grand-duke of Russia, was himself baptised by Greek missionaries. He also married the sister of the Greek emperor, and introduced Christianity into his dominions. The pagan idols were destroyed by his command, but idolatry was not completely eradicated in Russia till the 12th century. The first metropolitan of Kiew was instituted about 900, by the patriarch of Constantinople. From that time the metropolitans of Kiew, who presided over all the churches of Russia, were consecrated at Constantinople, and generally chosen from among Greeks. After the capture of Constantinople by the Latins, when the seat of empire, as well as that of the patriarch, was transferred to Nicæa, the metropolitans of Russia were consecrated in that city until the expulsion of the Latins, when things returned to their antient order

The popes made several attempts to extend their supremacy over the Russian church, and there seems to have been some intercourse between Rome and Vladimir the Great, as the patriarch of Constantinople urged that prince to break off every correspondence with the pope. The grand-duke Jsiaslaf being expelled from his throne, in 1073, by his brother, sought refuge at the court of the emperor

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cquired provinces have retained their former laws for civil cases,
cases are judged according to the Russian laws.

* It has not yet been put into execution.

Henry IV., and sent his son to Rome, in order to interest Gregory VII. to restore him to his country, on which he promised to submit to the papal dominion, spiritual as well as temporal. Gregory wrote a letter in 1078 to the brother of Jsiaslaf, and admonished him to relinquish the sovereignty which he had usurped. The papal admonitions produced no better result than the imperial remonstrances to the same effect, and Jsiaslaf having recovered his throne after the death of his brother, thought no more about the pope. The chronicles mention different attempts of the Roman see to establish its dominion over Russia, but we are left in doubt whether these negociations were attended with any result. One circumstance seems to imply that the popes possessed some influence at Kiew, about the end of the 11th century, as Ephraim, a learned Greek who occupied the metropolitan see of that town from 1070 to 1096, introduced into the Russian calendar, under the 9th May, the commemoration of the translation of the reliques of St. Nicholas from Lycia to Bari in Italy; a feast which is unknown in the Greek church, but is observed by that of Rome. It is very possible that before the separation between the Western and the Eastern churches was completed by Michael Cerularius, the metropolitans of Russia were sometimes wavering in their obedience between Constantinople and Rome. The papal power however never gained a permanent footing in the Russian territory, although that of Halich, situated between the Roman Catholic countries Poland and Hungary, was the object of its unceasing efforts. The Hungarians having, in 1214, occupied the principality of Halich, endeavoured to subject its church to the supremacy of Rome, but their expulsion from the country destroyed all hopes of that connection. Daniel, prince of Halich, who was equally distinguished as a warrior and as a politician, thought that he might derive some assistance from the pope against the Mongols, to whom he was obliged to pay tribute and do homage in the camp of their khan. He therefore opened a negociation in 1247 with pope Innocent IV., who sent a legate to receive the submission of Daniel and that of the church of Halich, to which he promised permission to retain all such customs and observances as would not be in direct opposition to the doctrines of the church of Rome. Daniel hesitated a long time, but at last, in 1254, he accepted a crown and the other insignia of royalty from the pope. He was crowned by the legate as king of Halich, and formally acknowledged the supremacy of Rome. But as the promised assistance did not come, he broke off his connection with the pope in 1257.

The invasion of the Mongols, and the consequent subjugation of Russia, had great influence on the ecclesiastical condition of that country. Many churches and monasteries were destroyed, and the clergy massacred during the invasion of the Mongols, but as soon as they had permanently established their dominion in Russia, they sought to strengthen their power by gaining over to their interest the clergy of the subjugated country. In consequence of this policy the khan of the Mongols declared that all individuals connected with the church establishment should be excepted from the rolls on which the population of the conquered country was registered for the capitation-tax, in the years 1254 and 1255; and in 1257 the same khan, by his yerlik, or letters-patent, granted to all the Russian clergy, and to all persons connected with the churches, as well as their families, complete exemption for their persons and property from all taxes or services paid or rendered to him by the inhabitants of Russia. A Russian bishop was always resident at Saray, the capital of the khans, by whom those prelates were sometimes employed in offices of high trust; thus the Bishop Theognost was sent, in 1279, by the Khan Mengutemir as ambassador to the Greek emperor, Michael Palæologus.

The favourable position which the Russian church enjoyed under the dominion of the Mongols, and subsequently under that of the Tartars, increased its wealth and influence. Many persons sought refuge from the universal oppression of their barbarous masters by entering the church, while many others, in order to secure the possession of their estates, made grants of them to the church, from which they received them back as tenants.

Kiew was destroyed by the Mongols in 1240, but the authority of the khans being never so firmly established in the western as it was in the eastern principalities of Russia, the former were constantly distracted by disturbances. This circumstance induced Maxim, the metropolitan of Kieff, to transfer his see, in 12[illegible]9, to Vladimir on the K[illegible] capital of the grand-dukes of Russia, chief vassals [illegible] khan, under whose protection the head of the Russian church enjoyed perfect security.

Kiew and many other principalities of Western Russia were united with Lithuania in the fourteenth century. [LITHUANIA.] The metropolitans of Vladimir, who afterwards transferred their residence to Moscow, endeavoured to maintain their supremacy over the churches of Lithuania, and for that purpose sometimes went to reside in that country. Yet notwithstanding all their efforts, the separation between the churches of Moscow and Lithuania was continually increasing, and it was completed in 1415. [illegible] the bishops of Lithuania, assembled at Novogrodek, el[illegible] Gregory Zamblak metropolitan of Kiew, whose successors continued independent of Moscow, and acknowledged only the supremacy of the patriarch of Constantinople, as long as they remained under the dominion of Poland, with which Lithuania was finally united. Since that epoch th[illegible] been two independent Russian churches, the [illegible] church of Muscovy and that of Poland.

The church of Muscovy was governed by its metropo[illegible] who either received their consecration from the patriarchs of Constantinople, or were only approved by them. The metropolitan Isidore, a learned Greek, went from Moscow to assist at the council of Florence, in 1438, where he subscribed to the union with Rome. He returned to Moscow in 1439, with the dignity of cardinal, and invested with the authority of a legate; but he was deposed and imprisoned in a convent, whence however he succeeded in e[illegible] and died, at an advanced age, at Rome. After the capture of Constantinople by the Turks, the metropolitans of Moscow were elected and consecrated without any reference to the patriarch of Constantinople. In 1551 a general synod held at Moscow enacted a code of ecclesiastical laws, c[illegible] *Stoglav*, that is, the hundred chapters.

In 1588, Jeremiah, the patriarch of Constantinople, came to Moscow, in order to get pecuniary assistance for his churches. The assistance was liberally granted by the devout Czar Fedor Ivanovich, and Jeremiah consecrated the metropolitan of Moscow as patriarch of Russia. These patriarchs enjoyed extraordinary influence, not only in ecclesiastical but also in temporal affairs; their consider[illegible] was increased by the public marks of respect which were shown to them by the czars, who on every Palm Su[illegible] led the ass on which the patriarch rode through the [illegible] of Moscow, in commemoration of the entrance of our Saviour into Jerusalem. Under the Czar Alexey the church [illegible] disturbed by the rise of many sects.

In 1682 the Slavono-Greco-Latin academy, the first e[illegible]siastical high school that was founded in Russia, [illegible]blished, by the Czar Fedor Alexeyevich. After the [illegible] the patriarch Adrian, in 1702, Peter the Great abolished [illegible] dignity, proclaimed himself the head of the Russian [illegible] and established a supreme council for ecclesiastical [illegible] under the name of the 'most holy synod.' Peter [illegible]dered schools to be established in every episcopal see, [illegible] declared that the convents should not acquire [illegible] estates, either by gift or purchase; he subjected [illegible] of the church to the general taxation, and introduced reforms into the organization of the church. In 17[illegible] Empress Catharine confiscated all the estates of the ch[illegible] which contained above 900,000 male serfs, and as[illegible] pensions to bishops, convents, &c. Several ecc[illegible] seminaries and schools were established during t[illegible] of Catharine, Paul, and Alexander, and their c[illegible] was fixed by an ukase of 1814.

Such is a brief sketch of the history of the [illegible] church of Muscovy, which must be completed by a [illegible] sketch of that of Poland.

It has already been said that the Russian or G[illegible] church of Poland was completely separated from [illegible] Moscow in 1415, by the election of a metropolitan of [illegible] who became the head of the church of Poland. H[illegible] [illegible]thority extended over the Russian population of Lithu[illegible] and the principality of Halich, which was united with [illegible]land in the fourteenth century, and accordingly comprehended the dioceses of Kiew, Chernigow, Turow, Smolensk, Polotsk, Lutsk, Chelm, Vladimir, and Leopol. Altho[illegible] the dominant religion of Poland was the Roman Cath[illegible] the privileges of the Russian church were secured by sev[illegible] enactments, and its followers enjoyed equal rights with t[illegible] of the Roman Catholic church. The faith of the R[illegible]

:hurch was professed not only by millions of the common people, but also by a great number of nobles, among whom there were many of the first families of the land, and even several branches of the royal house of the Jagellons, such as the Czartoryski and Sanguszko.

The Russian clergy of Poland sent a delegation to the council of Basle, but they did not come to any understanding about a union with Rome. The efforts of Isidore, metropolitan of Moscow, who passed through Poland on his return from Florence, to promote the same union, seem not to have been attended with any success. Yet although the Russian church of Poland opposed a union with Rome, it was, notwithstanding the community of dogma, equally adverse to a connection with the church of Moscow, and all the efforts of the latter to establish its influence over that of Poland proved abortive. As an instance of the hostility which existed between these two churches, we may mention that Kiew was pillaged in 1484, by the khan of the Crimea, at the instigation of the grand-duke of Muscovy, to whom the khan sent as a present a part of the church-plate.

In 1509 the Russian church of Poland held a general iod at Vilna, in which it enacted many important regu- ions. Several bishops of the same church, who assembled a synod in 1594, at Brest in Lithuania, proposed a union ith Rome. This project was zealously supported by mund III., king of Poland, as well as by the Roman uolic clergy of that country. A delegation of these ishops went to Rome, where they subscribed the union of Florence of 1438, which after their return was confirmed by a new synod convened in Brest in 1596. Many clergymen ever and a great part of the nobles belonging to that urch, with Prince Ostrogski, the most powerful grandee of Poland, at their head, rejected the union, and the oppo- parties mutually excommunicated each other. The -Roman party sought to effect a union with the Protestants at a meeting held at Vilna in 1599, but the project ed, chiefly through the clergy, who wished the Pro- ints to submit to the patriarch of Constantinople.

oland enjoyed a high degree of civilization at a time when Muscovy was still in a barbarous state of ignorance. It was therefore natural that the Russian or Greek church of Poland should be very superior in learning to that of scovy. Its first book of prayer was printed at Cracow 488; but the first book (the *Acts*) was not printed at scow till 1564. The printers were however obliged to ve Moscow, where their art brought upon them the sus- ion of heresy, and they retired to Poland, where they nted several books for the use of the Russian church. In 1581 prince Ostrogski, palatine of Kiew, caused the whole le, in Slavonian, to be printed on his estate of Ostrog. book, which is well known to bibliographers, was re- ited several times. An ecclesiastical academy was esta- bed at Kiew in 1633, by the metropolitan Peter Mobila EEK CHURCH], and its privileges were confirmed by Vladislav, the fourth king of Poland, and the diet. This v, founded on the model of the Roman Catholic nts of that kind, diffused a considerable degree among the clergy of the Russian church of d; and Peter the Great, as well as his predecessor , was obliged to invite from that country learned nes and teachers, in order to improve the intellectual ition of his own church.

ie party which had subscribed to the union with Rome supported by the king and the influence of the Roman olic clergy. This party grew every day stronger, oppressed its opponents, who convened a synod at in 1623, in which they elected bishops in opposition ose who had subscribed to the union. From that time ouble hierarchy has existed in the Russian church of d,* and this division has led to the most melancholy l consequences. [POLAND.] The anti-unionist party er gradually submitted to the supremacy of the pope, only one diocese, that of Mohilew, remained under the nce of the patriarch of Constantinople, and it was by Russia at the first dismemberment of Poland in

arine II. and Paul endeavoured to force the united churches of the incorporated Polish provinces to renounce their union with Rome, and to acknowledge the spiritual supremacy of the monarchs of Russia. Their attempts had partial success among the churches which had only recently formed this union, while those which had effected it at an earlier period persisted in their connection with Rome, notwithstanding the persecution to which they were exposed. Under the emperor Alexander the persecution was discontinued; but under Nicholas, in 1839, the bishops of the united church being prevailed upon to sign a renunciation of their obedience to Rome, all the churches of their dioceses were by an imperial ukase ordered to do the same, and a great number of clergymen who opposed this measure were transported to Siberia.

Present State of the Russian Church.—The emperor is the head of the church, the affairs of which are administered by a supreme council, called 'the most holy governing synod,' composed of ecclesiastical and lay members, whose number is not limited. The body usually consists of two metropolitans, two bishops, the chief secular priest of the imperial staff, and of the following lay members:—the procurator or attorney, two chief secretaries, five secretaries, and a number of clerks. The procurator has the right of suspending the execution of the decisions of the synod, and of reporting any case to the emperor. The synod decides all matters relating to the faith and the discipline of the church, and generally performs the functions of the ecclesiastical courts of this country. It has also the superintendance of the administration of the dioceses, from which it receives a report twice a year of the state of churches, schools, &c., as well as the register of births, marriages, and deaths.

The Russian church contains forty dioceses, divided into three classes: the first (containing four dioceses) is governed by metropolitans, the second (sixteen dioceses) by archbishops, and the third (containing the remaining dioceses) by bishops. All those prelates who are comprehended under the general appellation of archiyerey, differ only in rank, and do not depend on each other, but immediately on the synod. Each diocese has a consistorial court, whence an appeal may be made to the *archiverey*, and from him to the synod.

Episcopacy is confined, as it is in the Greek church, to the monastic clergy. The highest preferment to which the secular clergy can attain, is the rank of chief priest of the Imperial staff, and the individual who occupies that place is generally also the confessor of the sovereign; and, as already observed, he has a voice in the synod. The ecclesiastical law of Russia is the Greek Nomocanon, with the addition of some ordinances issued on several occasions.

There are four ecclesiastical academies in Russia, at Moscow, St. Petersburg, Kiew, and Casan, besides numerous seminaries. All the sons of the clergy must be educated in these seminaries, many of which contain colleges, called burses, in which the poorer students are maintained gratis. This compulsory system of education has had the effect of making many of the sons of clergymen the most learned men in Russia. The clergy form a kind of separate body in Russia, and it is a very rare occurrence that a person belonging to another class enters the church. The sons of clergyman are, as a general rule, obliged to follow the profession of their parents, and they must obtain a licence before they can adopt any other profession. This licence however has been easily granted, and is become a mere formality, and we believe the practice of obtaining it is now abolished or disused.

Dissenters. — There are numerous dissenters from the Russian church, generally called *Ruskolniks*, from the Russian verb *raskolot*, to 'split,' which signifies dissenters or schismatics. The beginning of this dissent dates from the introduction of Christianity into Russia. In 1003, fifteen years after the establishment of Christianity in Russia, a monk called Andrew attacked the hierarchy, the worship of images, and some other doctrines of the Eastern church; but he recanted his opinions, and returned into obedience to the established church. Nicephorus, metropolitan of Kiew (1122-26), imprisoned an individual called Demetrius for spreading heretical opinions. An Armenian monk named Martin (about 1150), in a work called *Prawda*, i.e. the truth, attacked the established church, but rather in its liturgy than its dogmas. He taught that the religious processions should begin their march from the north to the south, and not contrarywise, as is usual with the Greek church; that hallelujah should be repeated at the end of psalms twice instead of thrice; but he insisted particularly that the sign of the cross should be made with two fingers (which is the Armenian manner), and not with three, as is prescribed by the established church, being, as some pretend, typical of the trinity. However unmeaning these differences may appear, they are very remarkable, because they constitute, even now, among the great majority of Raskolniks, their chief grounds of opposition to the established church. The doctrines of Martin were condemned by a synod in 1157, and he was himself sent to the patriarch of Constantinople, before whom he recanted, and became reconciled to the church. His doctrines were however preserved by a small number of followers, and re-appeared with great force at a later period.

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* expression, 'Russian church of Poland,' may appear strange to those not sufficiently conversant with the history of that country. It must ore be remembered that the Polish empire was composed of three nations, Lithuanians, and Russians, and that the last are not to be confounded he inhabitants of Muscovy, the sovereigns of which assumed the title of onarchs of Russia only at a recent epoch.

An individual called Seit preached some heretical tenets in 1312. All we know of them is, that an assembly of bishops at Pereyaslaff, in 1313, condemned those tenets and severely punished their author.

In 1375 a citizen of Novgorod called Karp Strigolnik accused the clergy of simony, on account of the custom then established in Russia, of the bishops receiving payment for conferring holy orders. At the same time he rejected confession to a priest. He had many partisans, and a contest between them and the supporters of the established church ensued in the streets of Novgorod. Strigolnik's party was defeated, and himself, with some of his principal adherents, thrown into the river and drowned. The rest however survived, and must have attained considerable importance, as the patriarchs of Constantinople several times addressed the bishops of Russia on that subject. The republican institutions of Novgorod and Pskov seem to have prevented any severe persecution against those sectarians; and it was only when these states fell under the dominion of Moscow that the Strigolniks were obliged to seek refuge in the border provinces of Sweden and Poland, where they still continue to exist, though under different names.

Towards the end of the fifteenth century, the so-called Jewish sect produced a great stir in the Russian church. Its origin is ascribed to a Jew named Zacharias, who is described as an astrologer and necromancer, and who came from Poland to Novgorod about the year 1470. He began to teach secretly that the only divine law is that of Moses; that the Messiah was still to come, and that the worship of images was a sin. He made his first converts among clergymen and their families, who became so zealous in their new persuasion, that they desired to receive circumcision. But Zacharias persuaded them not to discover by such an act their real sentiments, and to conform outwardly to the Christian religion. The clergymen followed this prudent advice, and strictly performed the duties of their calling. The number of proselytes considerably increased, chiefly among the clergy and some principal families of the town.

These sectarians covered their real opinions with such a display of zeal in the rigid observance of the precepts of the church, that they acquired a great reputation for sanctity. Two of them, Alexis and Dionysius, were accordingly transferred to Moscow, in 1480, by the grand-duke Ivan Vasilovich, as priests to two of the principal churches of the capital. Alexis advanced high in the favour of that monarch, to whom he had free access, which was a rare distinction. This circumstance gave him great facilities for propagating his opinions, and he made many proselytes, the principal of whom were the secretary of the grand-duke, Theador Kuritzin, who was employed on several diplomatic missions; and Zosimus, the archimandrite of the convent of St. Simon, whom the grand-duke, on the recommendation of the same Alexis, raised to the dignity of metropolitan of Moscow. Thus the head of the Russian church was secretly its bitterest enemy.

Alexis died in 1489, and it was only after his death that his opinions became known. The grand-duke then declared that he remembered some very strange mysterious words of Alexis. It is also said that he confessed that his daughter-in-law Helena, daughter of Stephen the Great, prince of Wallachia, was seduced to the Jewish sect by a disciple of Alexis. The existence of this sect was discovered by Gennadius, archbishop of Novgorod, who sent to Moscow several priests accused of having insulted the cross and the images of the saints, of having blasphemed against Christ and the Virgin, and denied the resurrection of the dead. A synod was assembled at Moscow in 1490, in order to try these heretics. The metropolitan Zosimus presided, whose participation in their tenets, as well as that of the secretary Kuritzin, was not then discovered. The accused denied the charge, but sufficient evidence was brought forward to prove the fact. The bishops wished to punish the heretics severely, but the grand-duke opposed them, and declared they should only be anathematised and imprisoned. This leniency is indeed astonishing, if we consider the barbarity of the age, as well as the cruel temper of the monarch; and it must be ascribed either to the importance which was attached in those times to the anathema of the church, which the grand-duke considered a sufficiently severe punishment, or, which is more probable, to the influence of the secret abettors of [illegible] sect. The archbishop of Novgorod punished many of [illegible] with more severity.

Theodor Kuritzin and other adherents of the s[illegible] continued to propagate its doctrines, and to increase the [illegible]ber of its followers, particularly by teaching astrology. [illegible] began to spread a spirit of doubt and inquiry am[illegible] people; and clergymen and laymen were constantly [illegible] about the dogmas of religion. The sectarians were [illegible]ted by the metropolitan Zosimus, who is accused of h[illegible] persecuted the orthodox clergy.

The details about this sect are contained in a w[illegible] Joseph, hegumenos or abbot of the convent of Volok[illegible] who died in 1516, and who was the most zealous adv[illegible] this sect. He boldly accused the metropolitan [illegible] a supporter of these heretics. Zosimus re[illegible] dignity in 1494, and retired into a convent. [illegible] were assigned for this, but the fact is that he [illegible] pelled to do it on account of his heresy. It [illegible] the grand-duke wished to avoid the scandal [illegible] have been caused, if the heterodoxy of the head of [illegible] church was proved, or perhaps he disbelieved the accusa[illegible] enemies. There are some grounds for the latter [illegible] as the same Joseph laments the lukewarmness of the [illegible] duke in one of his letters. The persecution ceased for [illegible] time at Moscow, but the archbishop of Novgorod continued it in his diocese, whence many sectarians fled to Germany and Poland. In 1503 the representations of the clergy, which were supported by this Joseph, induced the grand-duke to issue an order for the trial of the heretics. They were tried before an ecclesiastical court, of which Joseph was a member and their chief accuser. The heretics acknowledged their opinions, and maintained them to be true. They were condemned, and some of them publicly burnt; others had their tongues cut off, and many were shut up in prisons or in convents.

Nothing more has been heard of the sect since the date of 1503, but there now exists among the Ras[illegible]niks of Russia a sect which observes the Mosaic rites, and it is very probable that it is derived from the sect which we have described.

The principal dissent in the Russian church was caused by the emendation of the corrupted text of the Slavo[illegible] version of the Scriptures, and other sacred books [illegible] same tongue, which are used by the Russian church. The text of these books, transcribed by ignorant copyists d[illegible] the dark ages of the Tartar domination, was disfigured by omissions, and still more by the additions with which some ignorant transcribers attempted to supply the omis[illegible] The necessity of correcting such defects was represented by the metropolitan to the czar Vasil-Ivanovich, who [illegible] 1520, requested the Greek convent of Mount Athos t[illegible] him a person competent to compare the Slavonian sacred books with the Greek texts from which they were [illegible] lated. A Greek monk named Maxim, thoroughly [illegible] versant with the Greek and Slavonian languages, was [illegible] to Moscow. He began his labours with great zeal, [illegible] continued them for ten years; but he was accused by [illegible] ignorant clergy of Moscow of heresy, and was shut [illegible] a convent, where, notwithstanding all his protestati[illegible] orthodoxy, he remained till his death in 1555. The necessity of amending the corrupt text was acknowledged [illegible] several occasions; but it was only under the czar Al[illegible] Michaelovich that this measure was carried into [illegible] tion. In 1654 a council was assembled at Moscow, in [illegible] Nicon, the patriarch of Moscow, presided. It was c[illegible] of thirty-six bishops, and the patriarch of Antioch, [illegible] decided unanimously on the necessity of revising [illegible] corrupt text of the Russian sacred books. This deci[illegible] approved by the patriarch of Constantinople; and [illegible] made an order that there should be collected fr[illegible] of his empire manuscript copies of the sacred , and he received above five hundred copies of Greek texts from Mount Athos. The patriarchs of dria and Antioch, and several bishops of the East, many manuscripts to Moscow on this occasion. This ortant affair was suspended for some time by a quarrel ween the czar and the patriarch Nicon, who was deposed by the synod assembled at Moscow in 1660. This synod, which the czar presided, was composed of the patriarchs Alexandria and Antioch (who were also mandatories of of Constantinople and Jerusalem), the new patriarch scow, fourteen metropolitans of Russia and the East, archbishops, five bishops, twenty-five archimandrites, hegumeni (abbots), and fifteen protopapas. It continued and completed the revision of the texts of the sacred books according to the antient copies.

The solemnity with which this reform was carried into t did not ensure the general approbation of the Mus- ue clergy and nation; many of the more ignorant declared it to be an heretical innovation, and oudly de- d against the heresy of the Niconians, as they called— r the name of the patriarch, whom they justly considered as the first mover of this measure—those who ived the revised books. The leaders of this party ally belonged to the lower clergy, with the exception bishop of Kolomna, who also strenuously opposed introduction of the revised text, and was in consequence osed from his dignity, and exiled to a distant convent, re he died in confinement; the Raskolniks consider as their first martyr.

But this fanaticism soon spread wider, particularly in the northern provinces. Both clergymen and laymen opposed Niconian heresy, as they designated the use of the d books. A terrible persecution now arose, and blood ned in many places. The fortified convent of Solo- k, situated on an island in the White Sea, declared for unrevised text, and became thenceforward the stronghold of the anti reformers, who bravely defended themselves against the forces of the czar; and, after a seven years' esistance, were reduced in 1675, when the monastery was aken by storm. Many of the besieged threw themselves nto the flames, and voluntarily perished. In some places, ny of the adherents of the old books shut themselves up n their churches, and others in their houses or barns, and hen setting fire to them, perished; firmly believing that hey should obtain salvation by what they called the baptism of fire, and that their souls would immediately rise o heaven in the shape of doves. Others to escape persecution fled to Poland, where they formed large settlements. Some even sought refuge in the Turkish dominions, where hey settled in considerable numbers on the right bank of he Danube.

The revolt of the Cossacks under Stenko Razin (Alexey elovitch), who filled the south-east of the Muscovite ions with carnage, gave the anti-reformers an opportunity of retaliating on the ruling party. Accordingly they d the standard of the rebel, and committed the great- excesses. It was a natural consequence that when the urrection was quelled, the severity of their persecution d be increased. This persecution, which was continued under Feodor, the son and successor of Alexis (1676-82), and during a part of the reign of Peter the Great, pro- ed dangerous riots even in the capital itself. At last, in 2, Peter the Great issued a ukase granting toleration to sectarians, but subjecting them to a peculiar tax, and ng that they should wear a medal of copper stamped a beard.

These adherents of the old text, who are designated by general appellation of Raskolniks, or dissenters, call elves *Starovertzee*, which signifies 'those of the old The name which is now usually applied to them, n officially, is that of *Staroobradtzee*, that is, 'those of old rite.' But although these appellations are in ge- indiscriminately applied to all those who dissent from ablished church of Russia, yet there are essential ences of opinion among them, both in respect of tenets, monies, and discipline. One great division consists of *Popovshcheena*, or those who have priests; and another the *Bespopovshcheena*, or those who have no priests. latter class comprehends a great variety of sects, most which have no common characteristic except the absence ained priests.

Popovshcheena, or those who have priests, approach nearest in doctrine and ceremony to the established church, from which they differ on the following points:—They reject the revised text of the Bible and of the Liturgy, and use only such as are literally transcribed or reprinted from the unrevised text. In making the sign of the cross they use two fingers instead of three; they repeat the *Hallelujah* only twice, after which they say 'Praise be to the Lord.' They begin their processions, not as prescribed by the established church, from the right to the left, but from the left to the right. They reject the usual form of the cross. They never shave their beards, considering it as a deadly sin, and they support their opinions by reference to the council or general synod of Moscow, held in 1551, which declared that—'Of all the heresies which are punishable by excommunication, none is more damnable and criminal than to shave the beard. Even the blood of the martyrs is unable to purify such guilt; consequently whoever shaves his beard for human considerations violates the law, and is an enemy to God, who has created us after his own image.' They also observe other prohibitions of this synod, which condemned as sins driving with one pole, eating hares, sausages, &c. They also consider the use of tobacco and snuff as unlawful. Indeed before the time of Peter the Great the use of tobacco and snuff was visited in Muscovy with several legal penalties.

Although the *Popovshcheena* consider the established church as involved in heretical errors, still they hold that the ordination of its priests is valid, although conferred by heretical bishops, because it descends in an uninterrupted succession from the times of the true church, that is, before the revision of the books. This opinion agrees with that of the church of England respecting the ordination of the Roman Catholic clergy, which it considers to be valid on account of the apostolical succession, notwithstanding the errors of the Romish church. In consequence of this doctrine the Russian dissenters admit priests who have been ejected by the established church, which is generally done for their bad conduct.

It has been already mentioned that at the time of the persecution great numbers of the Raskolniks fled from the country. Many of them settled in the Ukraine, which was then a kind of independent country, having recently acknowledged the czar of Muscovy rather as a protector than as a sovereign. They also formed extensive settlements along the frontiers of Poland, and many settled in the interior of that country. They built churches, and founded monasteries and nunneries, which were soon filled with inmates from the most distant parts of Russia. The most celebrated of these was Vietka, situated within the Polish dominions, not far from the Russian frontiers. It stands on a small island formed by the river Sosha, which falls into the Dnieper about forty miles below. This settlement was founded about 1690, by emigrants from the north of Russia, and being favoured by the landowner on whose property it was established, became so flourishing that it contained no less than 30,000 inhabitants. This community soon acquired a great celebrity among all the Raskolniks scattered through Russia, Poland, and the Turkish dominions; and the followers of the creed flocked from all parts to that place, which they considered as the fountain-head of the true doctrine. The monasteries and nunneries received inmates from the most distant parts, from the shores of the White Sea and the banks of the Don, and the society was constantly enriched by large donations. This prosperity excited the jealousy of the Russian government. It first offered them (in the years 1733 and 1734) an amnesty, toleration, and lands for a settlement. But the Raskolniks preferred the Polish government, and declined the offer. The Russian government, finding that all its efforts to induce them to quit the Polish dominions were ineffectual, resolved to obtain by force what it could not obtain by policy. Notwithstanding the peace then existing with Poland, an expedition consisting of five regiments of infantry, one of dragoons, and two of Cossacks, secretly passed the Polish frontier, and surrounded the settlements of Vietka. The churches and monasteries were destroyed, the inhabitants carried by force into Russia, many of them sent to Siberia, and their priests were confined in monasteries, and even the bodies of their saints disenterred and burnt. This event happened in the year 1735, under the reign of the empress Anne, and the community of Vietka was thus dispersed.

But scarcely had two years elapsed when the Raskolniks again began to assemble at Vietka, and five years after the place was entirely rebuilt, and became more flourishing than ever. The persecution which it had suffered gave it the reputation of sanctity; and the numbers who flocked thither to settle, or sent donations to support the settlement, were greater than before. The community of Vietka must have been indeed prosperous, when, in 1758, its convents contained 1200 regular monks, not including lay-brothers.

The Russian government again held forth promises of protection, in the hope of inducing them to return to Russia. But these promises producing no better effect than the former, it had again recourse to violence. In 1764 another inroad was made, and the scenes of 1735 were re-enacted. Twenty thousand persons were carried away, and, almost without exception, sent to Siberia as colonists. Notwithstanding these repeated outrages many of the sect remained at Vietka and in its vicinity, but Russia made no more attempts to compel them to return, inasmuch as by the partition of 1772 it became master of that part of the Polish dominions.

A great number of sects are comprehended under the general appellation of *Bezpopovshcheena*, or those who have no priests. The most important of these sects is that of the *Pomoranes*, which signifies 'the inhabitants of the sea-coast,' because it originated on the shores of the White Sea. They are also called *Anabaptists*, because they baptise afresh all those who become their converts. They maintain that all priests of the established church ordained since the time of the patriarch Nicon, are falsely so called, and that baptism administered by them is a profanation; that marriages solemnised according to the rites of the same church are invalid, because there are no longer any true priests to give the nuptial benediction; and they conclude and dissolve marriages at will: that churches are the houses of the Antichrist, whose reign has already commenced, although, being himself invisible, he reigns only in spirit. They confess one to another; they administer the sacrament to themselves; and the bread which they use on that occasion is said to be derived from some consecrated loaves saved from the convent of Solovetzk, which, as we have already mentioned, was for a considerable time the stronghold of these sectarians, but was taken in 1675 by the troops of the czar. This consecrated bread is multiplied by working the fragments of it with a new paste, and the loaves thus prepared are considered as holy as the originals. The sacred bread has thus descended in uninterrupted succession from loaves consecrated before the Niconian heresy, that is, before the revision of the Liturgy. Each of these sectarians is always provided with a crumb of this bread, in order that he may be able to receive the sacrament in case of emergency, and the rich are obliged to pay a high price for their portion. They have places of worship, where they assemble for prayer, and where one of the members officiates as priest; but he has no ordination, and frequently changes his ecclesiastical vocation for some other employment. There are many subdivisions of this sect, the principal of which are the Theodosians and the Philipons, who derive their appellations from the names of their respective founders, both of whom were runaway priests of the established church. The points on which they differ from one another are trifling, and relate merely to some forms of worship; and they vie in acts of the wildest fanaticism, which is particularly manifested by their inclination to commit suicide by burning themselves. They support the doctrine of suicide by the text of St. Mark (viii. 35):—'For whosoever will save his life shall lose it; but whosoever shall lose his life for my sake and the gospels shall save it.' A remarkable instance of the fanaticism of these sects occurred in the province of Archangel in 1742. A commission of inquiry sent by the government came to a newly constructed monastery which contained about fifty individuals. This convent was a large wooden building, with narrow windows, and was enclosed by a wall of timber. The commissioners were not only refused admittance, but received every kind of abuse and imprecation. They ordered the gate of the enclosure to be broken open; but as soon as the order was carried into effect, they saw the convent in flames; and the entrance was so strongly barricaded with large pieces of timber, that all their efforts to save the inmates were unavailing. But this mode of self-destruction, by which life is speedily extinguished, is much less horrible than starving to death, of which some revolting cases were reported in the official inquiries made upon the subject. It is said that persons sometimes make a vow to fast forty days, in imitation of the fasting of our Saviour in the desert; and that they are generally induced to commit such acts of fanaticism by who succeed to their property. These unfortunate are locked up in a house, barn, or any other building ated in some remote and unfrequented place, and watched. After a few days the poor victims repent; but their entreaties for food or drink produce no effect on fanatical guardians. There are many other anecd less tragical nature related of these sectarians. them, after having calculated the time of the last judg imagined that they had found out the very day and In order to meet it becomingly, they dug their gra laid themselves therein dressed in their shrouds. however passed on, until the urgent cravings of n minded them that they were still of this world, a pelled them to resume their ordinary occupations.

Other sects differ in certain dogmas and cer the true Pomoranes, but all are united in their the established church. The members of these numerous all over Russia, and many of them have in Livonia, Prussia, Austria, Turkey, and Poland. they held a synod in Poland, the decisions of which prised in forty six articles, display the wildest fana and the grossest superstition.

The *Capitonians*, a sect founded by a monk *piton*, have no places of worship, but they as prayer and other religious purposes in their dwel Like the Pomoranes, they dissolve marriages at said to live in a state of great licentiousness. of the sect administers the sacrament after a st A girl fastens on her head a sieve filled with after prayers, accompanied with frequent pro presents the raisins to the assembly. This sect on account of that strange ceremony, by the nick *Podreshetnikee*, that is, 'those from under a sieve.'

The *Samokreshchennikee*, or 'self-baptisers,' are founded by a common peasant called Roman Danilo They baptise themselves by repeatedly diving into a rive

The *Samostrigolniks*, that is, 'self-tonsurers' (sure is considered as the ordination of a monk), are founded in 1700 by Fedor Rostow and a nun called Anth According to their doctrine, every one may bec or nun by tonsuring his or her own hair, p cowl before the image of a saint, taking another performing other rites usual in taking the monastic vows.

A sect founded in 1715 by a strelitz called Procopius kin, and another individual of low condition named Nagoy, chooses a man to personate Christ, and a woman to personate the Virgin, and they worship them. They also employ twelve individuals to represent the apostles, &c. Great abominations are imputed to this sect, but possible to know with what degree of truth.

There is a numerous sect amongst the Cossacks of Don, called *Shchelniki*, i.e. 'Chinkmen,' because in their prayers they look on a chink through whi light is passing. They have no images, which they reject as forbidden by the second Commandment. They neve to church, saying that God dwells not in a house men, but is omnipresent. They make use of the sacred books, in which respect they differ from all Raskolniks.

In several parts of Poland, Turkey, and in government of Tula, there are the followers *neurshcheena*. The origin of this appellation is un and it is probably derived from the name of their fou or some leading member. Although Russians by o language, they strictly observe the Mosaic law, circumcision, keep the Sabbath on Saturdays, and the Christian religion. It may be that they are scendants of that Jewish sect which appeared at and Moscow at the close of the fifteenth century.

The *Molokane*, or 'milk-drinkers,' eat milk and Wednesdays and Fridays, which the established chu not permit on these fast days, but they observe a rigid on Sundays. Their dogmas and ceremonies are known. They have some strangely shaped images which they carefully conceal from persons who do not long to their sect. They are also called Soobotniki 'Saturday-men,' but we are unable to say whether have any Judaic rites. On the whole the nature of sect is very little known.

The *Jkonoborshchina*, that is, 'Iconoclasts,' and always pray in the open air. We know their dogmas.

lkulinovshcheena are a sect founded by a woman of
e of Akulina. They form a kind of spiritual com-
They release, by a certain formality, the monks
-ts who join them from their vows, and are accused
a life of great profligacy.

'hoovstvenniki or Sentimentalists, are a sect founded
nk called Benedict, who ran away from his convent.
juire nothing more than unity among those of the
aith (that is, who follow the unrevised books), and
ch that whoever keeps to that antient faith is in the
y to salvation, and that it matters little whether he
ot baptised afresh, or whether he belongs to the
ch has priests or to that which has none. Their
is not considerable, and many of them incline to

)oochobortzee, or 'combatants in spirit,' are a sect
ıs much resemblance to the Quakers and the Men-
They never take an oath, and they shed no blood.
tertain Unitarian opinions, and admit only the New
nt. They have neither churches nor priests, and
devotions make use only of the Lord's Prayer. This
ıme known under the reign of the empress Anne
), at Moscow and other towns, and a commission
inted to inquire into their tenets. Its origin is in-
ı darkness, and it is not improbable that it may be
ntient date. Under the reigns of Catharine II. and
y were persecuted, but they bore their oppression
eally Christian meekness and resignation. The
Alexander granted them toleration, and offered
them lands for cultivation in the deserts of Southern
They willingly accepted that offer, and they
y their industry, flourishing settlements in the
ted but fertile steppes.

ct of the *Bogomiles*, which was well known in the
pire, and of which a description is given by
and other ecclesiastical historians, is said to exist
he Raskolniks of Russia, and this circumstance
ıe supposition that some other sects comprehended
a above-mentioned appellation may have a similar
There are also many fanatics who inflict on them-
e same mutilation that Origen did; and frequent
of such acts of fanaticism have recently occurred
l parts of Russia.

are still many less important sects of the Raskol-
ch are distinguished by some absurd rites or ob-
. All the sects are confined to the lower classes,
ithstanding the progress of civilization, they are
reasing than decreasing. This must be ascribed
reat zeal for making proselytes, and to the cir-
es that any person who will join them and adopt
suasion, submitting to all their superstitious ob-
, is sure of the kindest reception and support,
may have been his former conduct. Although
o longer persecuted on account of their religion,
nly tolerated, and have no legal existence. Their
not acknowledged by the government as such,
ıot enjoy the privileges which are enjoyed in
t only by the clergy of all Christian persuasions,
by Mohammedan mollahs.

ount of these sects is chiefly extracted from a
ork, entitled 'Description of Antient and Modern
s,' &c., published under the authority of the go-
by a priest of the established church, who was for
me a member of one of those sects, and had
ercourse with different sectarians. It is how-
ssible to vouch for the correctness of all his state-

IAN LANGUAGE AND LITERATURE.
AN LANGUAGES.]

in the common acceptation of the term, is the red
nt substance which is formed on the surface of
ı exposed to air and moisture. It is an oxide
ınd in point of fact other metallic oxides may
ered as rusts of the peculiar metals which they con-
term is however limited in application to the red
er- or sesqui-oxide of iron.

[MILDEW.]

C or RUSTICATED WORK, in Architecture,
f decoration for walls, wherein the joints between
s, and between the separate stones in each course,
ly defined by sunk channels or grooves. Although
on of what would in itself be offensive, and there-
st apparently quite at variance with good taste, this mode is only a legitimate, artistical, or æsthetical imitation, suggested by accident or defects. The expression, originally derived from rudeness and coarseness of execution, from large stones irregularly put together, without their edges being smoothed and fitted to each other, is here only partially retained so as to indicate boldness and strength, and also a certain attention to finish and to regularity in the symmetrical arrangement of the courses and stones. There is a studied intention manifested, which prevents our confounding the imitation with what furnished the hint for it.

Although the preceding remarks partake more of criticism than of explanation, they may have their use here, if only as serving to correct a prejudice or misconception likely to be occasioned by the term itself as expressive of rude strength to the utter exclusion of anything like refinement or grandeur, of richness or studied symmetry and regularity. In reality however rustication contributes in an eminent degree to richness of surface, and it was accordingly frequently employed by the antients—by the Romans at least, not only in those works which were characterised by massiveness and by a certain degree of rudeness, such as amphitheatres, bridges, &c., but on the exterior of temples and other edifices, on which the most finished decoration was bestowed. For not only does rusticating the face of the walls occasion contrast, and thereby tend to set off columns or pilasters to greater advantage, but the lines and shadows so produced remove that blankness which might otherwise attend too much uniform plain surface. Undoubtedly it is a very great excellence in masonry, and a great beauty in itself, when the facing of a wall is uniformly smooth and even in colour, and the stones are put together with such extreme nicety that the joints can hardly be detected. Still the beauty so produced depends in some degree on that of the material itself—on its texture and colour, for were smoothness alone a particular merit, it may be obtained either by stucco or painting; in which case the uniformity of surface and the absence of joints rather detract from than add to beauty.

Besides being different from plain masonry, rustication admits of exceedingly great variety, both in regard to design and execution, and of great diversity of character, from severity and heaviness to studied elegance. The most obvious distinction is that arising from the surfaces of the rustics, according as they are either *plain* or *rough*; and if the former, they may be either *smooth*, or *hammer-dressed*, *i.e.* left slightly chipped; else *tooled*, or with the marks of the chisel. Or if intended to be rough, the rustics may be *vermiculated, hatched,* or *frosted*. The first of these modes is produced by cutting deep hollows into the surface, the second by making it jagged and rugged, while the third consists in giving a delicate crispness like frost-work to the stone.

As regards *jointing*, there are two modes: one in which the channels between the stones are *grooved*, or form rectangular sinkings; the other in which they are *chamfered*, that is, the edges of the stones are bevelled off in such manner that the section of the joints forms a rectangular triangle. Neither are the above by any means all the varieties, as will be seen by some examples at the end of this article, which cannot be very well explained without cuts. Great variety of character and design may further be produced by an intermixture of the different modes,—for instance, by smooth and rough rustics together, or by different kinds of rusticating for different stories, the bolder and coarser being placed below and the more delicate above, as is in a certain degree exemplified in the basement of the Excise-Office, London, which consists of two stories, the lowermost having rough, the upper one smooth rustics.

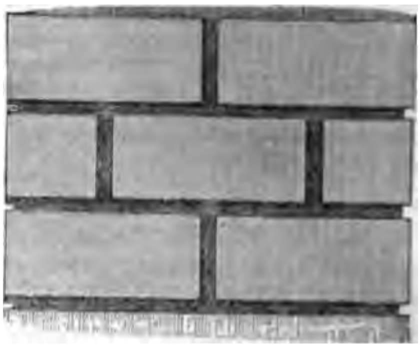
Italian architecture presents many fine studies and examples of rusticated work; and indeed its productions of that class possess infinitely more artistic merit than many of its columnar façades, where the orders are generally insipid, and sometimes so insignificant that the columns themselves are nearly the most trifling features in the design. The Florentine style—which, it may be observed, is the direct antithesis of the Palladian—shows what may be accomplished by little more than rustication alone. If it be severe, it is also simple, yet rich and grand and dignified; on which account, we should hardly hesitate to say that, unlike as it is in its forms, it possesses more of antique feeling, more of the sentiment of Grecian architecture than is to be found in many buildings professedly Grecian and adorned with Greek orders. Nevertheless the Florentine style has found little favour with those who have gone to Italy for their models. In this country we have very few examples indeed of rusticated work upon a grand scale: for here it is almost entirely confined to basements. It is scarcely ever employed as the general decoration of an entire front, except it be occasionally for prisons, for which it is certainly very appropriate, yet it does not therefore follow that it is unsuitable where richness and magnificence are more required than severity. Even if not for general purposes, the rusticated style recommends itself strongly for a class of buildings that have sprung up of late years, namely, railway termini.

Rustication however is now almost entirely banished from architectural design, or else an exceedingly poor and spurious kind of it is substituted, in which only shallow horizontal joints, or rather stripes, are shown, which, besides producing a most meagre and monotonous effect, give a wall the appearance of being faced with planks instead of built of blocks of stone bonded together. The exterior of Goldsmiths' Hall, London, is materially injured by the extreme poverty of the lower floor, which has merely a few horizontal streakings, without either moulded dressings or any kind of border or finishing to the windows. The lower windows, on the contrary, of the garden-front of the Travellers' Clubhouse are bordered with rough rusticated quoins, while the faces of the other rustics are smooth; which produces a most pleasing variety and contrast. Both in that and the adjoining Reform Clubhouse, Mr. Barry has given some tasteful specimens of rustic quoining, which differs from rustication merely in the rustics being applied only at the angles of a building, where they serve not only to give an expression of greater strength, but also to show that the design is completed and there terminates. It is a very great error to suppose that rusticated work is incompatible with elegance and elaborate finish. It is true that it admits of great rudeness and severity of character, but it also admits of the most studied and elaborate finish. So far too from requiring less care and accuracy than usual, the arrangement of the courses and rustics so as to combine them in perfect symmetry with arches, windows, &c., is a work of more thought and labour than would suffice for designing half a dozen Grecian porticos Much of the beauty of rusticated fronts depends upon the form and proportions of the arches or openings, and on the arrangement, &c. of the rustics which form the voussoirs either to arched or straight-headed windows. Occasionally, moulded archivolts are substituted for radiating voussoirs, but the effect is not good, because they cut the horizontal joints of the courses very disagreeably; which, it may be observed, is likewise the case where the voussoirs form an *extrados* either concentric with the arch, or making a more elevated curve, as in most of the Florentine examples. It is far better to make the voussoirs *elbowed*, so as to unite with the horizontal courses, whereby the whole looks firmly bonded together. Sometimes imposts to arches are omitted altogether, or if there be such member, it is usually a mere plat-band, although occasionally it is moulded. In arches the keystone may either be similar or distinguished from the other voussoirs; which last may be done in a variety of ways, although the most usual one is to cut it into the form of a console, or else enrich it with a mask sculptured upon it, of which kind are the keystones to the arches of the Strand front of Somerset House, representing the nine principal rivers of England, personified as old men. *Bossages* is a term more particularly applied to rusticated cinctures on the shafts of columns, which may be either square or cylindrical, but should not greatly exceed the diameter of the shaft itself, more especially in the former case. Columns of this kind ought invariably to be engaged, and the wall behind them of course rusticated also. In such case the cinctures serve as ligatures to bind and incorporate them with the rest, whereas insulated columns with blocks upon their shafts are equally unmeaning and uncouth. The same remark applies to rustic blocks stuck at intervals upon the architraves of doors and windows, as for instance those of St. Martin's church, London, although there is no rusticating in that building. Of columns with bossages or rusticated cinctures, the two arches within the court of Somerset House are a tastefully-designed and well-executed example.

The following are some of the varieties of rusticating above referred to, drawn sufficiently large to show the precise form and section of the joints or grooves:—

No. 1. Rustics with rectangular joints or channe

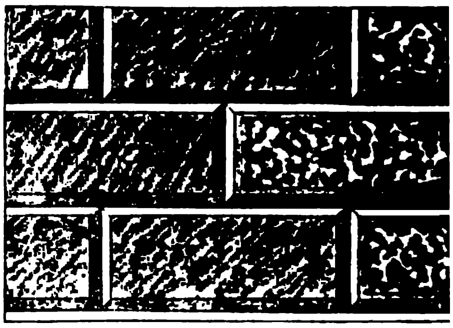
No. 1.



Rustics of this kind have always plain faces. Fr
horizontal rusticating, without vertical joints, has g
rectangular channels; this sort of rusticating, or
rusticating with horizontal joints only, has of lat
almost superseded the other modes in this country,
has been still further impoverished by making the c
broad and shallow, and the courses so deep that th
only a few horizontal streaks along the face of a wal

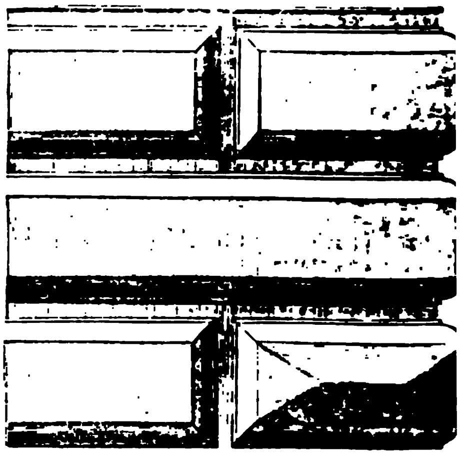
No. 2 is an instance of chamfered joints and vermi
rustics, bordered, that is, having a plain surface
their faces.

No. 2.



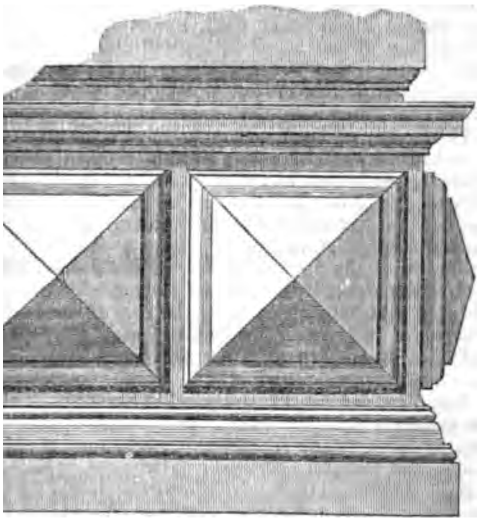
No. 3 shows an example of Florentine rusticati
moulded channels, the effect of which is particular
Of this kind is the rustic work of the Königl
Munich. [MUNICH.] One of the rustics is *face*
the cut, in order to give an example of that mode n
cated quoins.

No. 3.



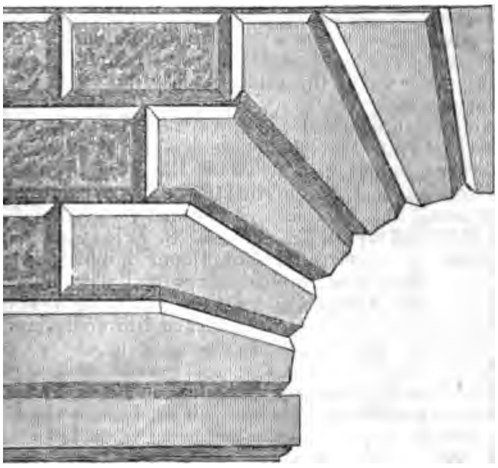
No. 4 is another mode peculiar to the Florentin
in which the rustics are *facetted*, or cut so as to fo
triangular surfaces. It is not used throughout, but
the lower course, forming a sort of dado to the bu
This example is from the same building as the prec

No. 4



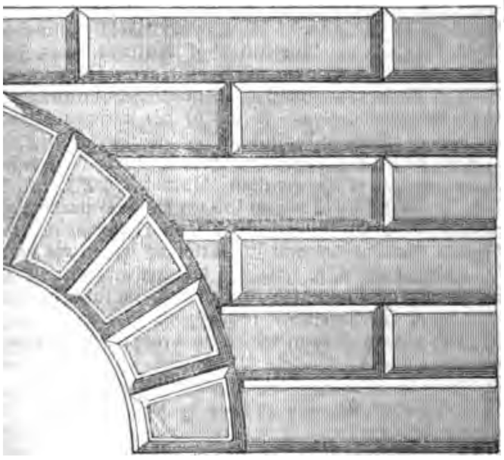
shows one-half of a rusticated arch having *elbowed* ; running into the horizontal courses

No. 5.



represents half of another arch with voussoirs *ctrados* form an eccentric curve from that of the .f, or else a pointed arch, while the *intrados* form a ılar one

No. 6.



\, the name of a genus of plants belonging to the ›rder Rutaceæ. The following is a description of us :—calyx four-partite, deciduous, shorter than the vhich are four and unguiculate, with the limb Stamens eight, longer than the petals; filaments ;, glabrous; anthers ovate, obtuse. Receptacle than the ovary, marked round with eight nectariferous pores, bearing the petals and stamens at the base. Carpels four, partly combined by means of the central axis (gynobase) into one four-lobed ovary, ovules 6-12 in each cell. Styles four, distinct at the base, united upwards into a single pistil which is attenuated towards the apex. Stigmas four. Capsules four, partly united, dehiscing internally at the apex. Seeds dotted. The species of this genus are suffrutescent herbaceous or perennial plants, with alternate exstipulate pinnated or decompound leaves covered with pellucid dots. The flowers are yellow, rarely white, and disposed in terminal corymbs or racemes. De Candolle enumerates twenty-four species of Ruta, of which comparatively few are generally known or cultivated. The species which has been longest known and most used, and perhaps the handsomest for culture is the *R. graveolens*, common Rue. It is a glaucous hairless erect herb or half-shrubby plant, with a strong heavy unpleasant smell, growing to the height of about two feet. The leaves are supradecompound, alternate, their lateral lobes linear or nearly so; the terminal ones obovate; they and all other parts of the plant are covered with transparent dots. Carpels terminal, leafless, trichotomous, cymose; petals four, wavy concave, a little irregularly toothed. Fruit roundish, warted, four-lobed, each lobe opening into two valves.

'. C., No. 1265.

Rue is sometimes called herb-grace, or the herb of grace, and in some parts of England ave-grace. This name is said to have been given to it on account of its use in exorcisms. In company with rosemary it has been used from time immemorial as an emblem of remembrance and grace on account of its evergreen foliage. The stamens are remarkable for their presenting an instance of vegetable irritability. When the time is come for the pollen to be introduced into the stigma, and thus presented to the ovules, the stamens, which are hard and rigid, and almost at right angles with the style, approach the stigma one by one, and after remaining in contact with it long enough to discharge their pollen, they return back to their original position parallel with the petals.

Rue is frequently cultivated as an ornamental plant, for which its curiously cut leaves, their glaucous hue, and the profusion of fine dark yellow flowers appearing for several months in succession, adapt it exceedingly well. It may be increased by seeds, slips, or cuttings. The seed should be sown in March; and when the young plants are two or three inches high, they should be put out in nursery rows; but propagating by slips or cuttings is best, especially for continuing varieties, of which there are three or four.

RUTA GRA'VEOLENS, a plant, native of the south of Europe, intermediate between an herb and a shrub, of a peculiar yellowish green colour. Every part of it is marked by transparent dots, filled with volatile oil. The leaves and immature fruits are officinal, and owe their virtue to the volatile oil and a bitter extractive. The odour is peculiar, strong, and penetrating; the taste intensely bitter, aromatic, and stimulating. One hundred parts of the fresh herb dry into twenty-two parts. The quantity of oil obtained by distillation with water varies much according to the period of growth when it is collected. Thirty pounds of the fresh herb before flowering scarcely yield one drachm, while twelve pounds with the fruits almost ripe yield nearly one ounce. Rue possesses powerful stimulant, antispasmodic, and tonic properties. The careless handling of the fresh plant sometimes causes rubefaction and vesication, and its improper employment internally has produced serious results. When judiciously used, it is very serviceable in hysteria and other convulsive disorders.

Oil of rue obtained from the fresh herb is green, from the dried herb yellow. It has the peculiar odour of rue, and a bitterish acrid cardamum-like taste. Its specific gravity is 0·911 It does not redden litmus-paper. The oil met with in commerce is rarely genuine, being an artificial compound of oil of turpentine with petroleum and oil of rue.

The pollen of the flowers produces inflammation of the skin; and any of it received into the eyes causes violent lachrymation, and other painful effects.

RUTA'CEÆ, a natural order of Polypetalous Exogens, characterised by the possession of hypogynous stamens, two or three times as many as the petals, cohering carpels with from three to five valves, an entire ovarium with several cells, imbricate calyx with four or five divisions, symmetrical hermaphrodite flowers with petals either wanting or as many as the lobes of the calyx, mostly twisted in æstivation; fruit capsular, the sarcocarp mostly separating from the endocarp; leaves without stipules, opposite, or alternate, simple, deeply lobed or pinnate, and covered commonly with pellucid resinous dots. They are trees, small shrubs, or herbaceous plants.

This order embraces the Ruteæ and Diosmeæ of A. de Jussieu, which are now made the principal sections of Rutaceæ. Ruteæ are known by their seeds containing albumen, and by the sarcocarp of the fruit not being separable from the endocarp. In Diosmeæ the seeds have no albumen, and the sarcocarp and endocarp are separable into distinct bodies when the fruit is ripe. A. St. Hilaire says that the observation of the adhesion of the sarcocarp and endocarp in Ruteæ has been made on unripe specimens of the plants, and that when ripe they are as separable as in Diosmeæ; whatever may be the real state of the case, the two sections are too obviously related in structure and general properties to permit of so slight differences elevating them into the importance of distinct natural orders. Rutaceæ agree with Aurantiaceæ in their dotted leaves, definite stamens, and fleshy disk. With Xanthoxylaceæ, Simarubaceæ, and Humiriaceæ, they have also many points of analogy. They are closely allied to Zygophyllaceæ through Peganum, which Jussieu and other writers place amongst Rutaceæ. They are found in the South of Europe, and in our hemisphere extend as far as the limits of the Old World. Diosma and allied genera are found at the Cape of Good Hope. Australia possesses Boronias, Phebaliums, Correas, &c.; and great numbers are found in the equinoctial regions of America.

Many of the plants of this order emit a powerful and usually offensive odour from the glands that cover their whole surface. These glands are sometimes so full of a volatile oil, that in hot weather the atmosphere surrounding the plant becomes charged with it, so that a lighted taper brought near the plant will cause the air to inflame. This is especially the case with Dictamnus. The Diosmas, or Bucku plants, are used in medicine as antispasmodics. The celebrated Angostura bark is produced by a plant (*Galipea officinalis*) [GALIPEA] belonging to this order.

Ruta graveolens.

a, Lobed fruit surrounding the central axis; *b*, section of a seed showing the embryo lying in the centre of the albumen; *c*, flower showing a double row of stamens, concrete carpels, and rim of the disk.

RUTH (רות), **BOOK OF**, a canonical book of the Old Testament, consisting of a narrative, of which the following is an outline:—During a famine, which happened in the time of the Judges, a man of Bethlehem-Judah, named Elimelech, removed into the country of Moab, with his wife Naomi and two sons. The sons took wives of the daughters of Moab, and they and their father died. The famine in Judah having now ceased, Naomi set out to return thither with her daughters-in-law, Orpah and Ruth. On the journey she gave them the choice of returning to their homes. Orpah returned, but Ruth clave to Naomi. It was harvest-time when they arrived at Bethlehem, and Naomi sent Ruth to glean in the fields of her husband Elimelech's wealthy kinsman, Boaz, who was struck with the maiden, and showed her kindness (chap. i., ii.) At the end of the harvest, Ruth, under Naomi's direction, claimed of Boaz the rights which he owed her as her nearest kinsman, or Goël, namely, marriage, and the redemption of her father-in law's estate. Boaz, after first ascertaining that a person who was nearer of kin to Ruth than himself declined to act as the Goël, married her (chaps. iii., iv.), and thus became the ancestor of David (iv., 18-22).

The history of Ruth seems to have been inserted in the sacred canon as a necessary link in establishing the pure genealogy of David, and consequently of the Messiah; and perhaps also to furnish a record of the fact that one of the Messiah's ancestors was a Gentile, thus intimating the great truth that the Gentiles were to have a part in the highest privileges of the Jews. In the antient Jewish canon the book forms a part of the Book of Judges, because the events recorded in it happened during the rule of the Judges. Its exact date is however uncertain, but most probably the famine mentioned in verse 1 is that which happened in the time of Gideon, about B.C. 1241. It is generally supposed to have been written by the prophet Samuel. The style is marked by a touching simplicity, and some parts of it are very pathetic. (The *Introductions* of Jahn, Eichhorn, De Wette, and Horne.)

RUTHERFORD, DANIEL, was born at Edinburgh, in November, 1749, and was educated at the university of his native city. In 1772 he took his degree of M.D., and it was in the thesis which he printed upon this occasion, entitled 'De Aere Mephitico,' that he announced the discovery for which he is chiefly remembered, of the gas which has since been called azote or nitrogen; for Rutherford merely indicated its existence as a peculiar air, and neither gave it any name nor explained its properties. The same discovery was also made about the same time by Dr. Priestley, and was announced by him in his paper 'On the Different Kinds of Air,' which obtained the Copley medal, and was published in the 'Philosophical Transactions' for 1772. Dr. Rutherford was admitted a fellow of the Edinburgh College of Physicians in 1777, and in 1786 he was appointed professor of botany in the university. He died 15th November, 1819.

RUTHERFORTH, THOMAS, D.D., was born in the parish of Papworth-Everard, Cambridgeshire, in the year 1712. Having taken his degree and obtained a fellowship in St. John's College, Cambridge, he was appointed Regius Professor of Divinity in the University, and created D.D. He was afterwards elected a fellow of the Royal Society, and obtained the preferments of the rectory of Barley in Hertfordshire, Shenfield in Essex, and the archdeaconry of Essex. He died in Oct. 1771.

Besides single sermons and charges to the clergy, Dr. Rutherforth is the author of the following works:—'Ordo Institutionum Physicarum, in privatis suis Lectionibus,' Camb., 1743, sm. 4to.; 'Essay on the Nature and Obligations of Virtue,' Lond., 1744, 8vo.; 'A System of Natural Philosophy, being a Course of Lectures on Mechanics, Optics, Hydrostatics, and Astronomy,' Camb., 1748, 2 vols. 4to.; 'A Letter to Dr. Middleton, in Defence of Bishop Sherlock on Prophecy,' 1750, 8vo.; 'A Discourse on Miracles,' 1751, 8vo.; 'Institutes of Natural Law, being the substance of a Course of Lectures on Grotius De Jure Belli et Pacis, read in St. John's College, Cambridge,' Lond., 1754-56, 2 vols. 8vo. A list of his sermons, tracts, and charges is given in Watt's *Bibliotheca Britannica*.

RUTI'LIUS LUPUS, a Roman rhetorician, who was a contemporary of Quinctilian (Quinct., *Inst. Orat.*, iii., 1, p. 150, Bipont), but of whose life we have no particulars. We possess a small treatise of his on rhetoric, entitled 'De Figuris Sententiarum et Elocutionis;' which we learn from Quinctilian (ix. 2, p. 152) was taken from a work of a contemporary of the name of Gorgias, in four books. The treatise of Rutilius does not appear to have come down to us in the same state in which he wrote it. It is now divided into two books, whereas Quinctilian says that it was only in one. It is several times quoted by Quinctilian, and is still valuable for the quotations which it contains from writers now lost.

The work of Rutilius was originally published by Roscius Ferrariensis, Venet., 1519, 8vo., and afterwards by Ruhnken, Lug. Bat., 1768, 8vo., the latter of which was republished by Frotscher, Lips., 1831, 8vo. There is also an edition by F. Jacob, Lub., 1837, 8vo.

RUTI'LIUS NUMATIA'NUS, CLAUDIUS, a Roman poet at the beginning of the fifth century of the Christian era, was a native of Gaul, and held at Rome the high offices of agister officiorum or palatii, and præfectus urbi. Having ccasion to return to his native country, he gave an account f his voyage, in a poem entitled 'Itinerarium,' written in legiac verse, and consisting of two books, of which the reater part of the latter is lost. Rutilius made the voyage a small vessel, which put into shore during the night nd sailed again in the morning. He describes with much eauty, and in the genuine spirit of poetry, the towns, ruins, nd various objects of nature and art which he saw, and eeply laments the ravages which had been committed by e barbarians of the north. Rutilius was a pagan, and in is voyage gives an account of the monks who lived at Ca- raria, and in other parts of his poem makes allusion to the tate of Christianity at that time.

The poem of Rutilius was first printed in 1520, Bonon., to. The best edition is by Zumpt, published last year 1840). Other useful editions are by Damm, Brandenb., 760, 8vo.; by Kappius, Erlang., 1786, 8vo.; and by Gruber, lorimb., 1804, 8vo.

RUTLANDSHIRE, an inland county of England, ounded on the north and north-east by Lincolnshire, on south-east and south by Northamptonshire, and on the st by Leicestershire. It is of compact form; the greatest ngth is from north-east near Essendine, on the road be- ween Stamford and Bourne, to south-west near Belton, ear the road from Uppingham to Leicester, nearly 19 es; the greatest breadth at right angles to the length is the bank of the little river Eye near Whissendine, to bank of the Welland at Tixover, 14 miles. The area is stimated at 149 square miles; the population, in 1821, was 8,487; in 1831, 19,385; showing an increase in ten years f 898 persons, or about 5 per cent., and giving 130 inhabit- to a square mile. In size and amount of population, below the rest of the English counties: its area is more than half that of Middlesex (282 square miles), next county to it in size; and its inhabitants are not more than one-third of those of Huntingdonshire pop. 53,192), the next county to it in population. In ensity of population, it is the thirty-fifth of English coun- ties; being next below Huntingdonshire, but exceeding the five counties of Hereford, Lincoln, Northumberland, Cum- berland, and Westmoreland. Oakham, the county town, is he vale of Catmoss, on the western side of the county; es in a direct line north by west of the General Post- London, or 96 miles by the road through Barnet, d, Higham Ferrers, and Uppingham.

ace, Geology, Hydrography, and Communications.— The north-eastern part of the county consists of a somewhat elevated plain or table-land, skirted on the southern side by the valley of the Wash, which opens on the west into the more expanded vale of Catmoss, a name derived by Camden from CoetMaes, Celtic words signifying 'a wooded plain.' The rest of the county consists of valleys whose general direction is east and west, divided from each other by narrow ranges of low hills. There are no very elevated points in the county; Manton, between Oakham and Uppingham, is said to be the highest.

The county is included in the district occupied by the lower formations of the oolitic series. The great oolite forms the north-eastern table-land above mentioned, and occupies also the higher ground on the eastern side of the county from Stamford to within two miles east of Uppingham: the prevailing rock is a close-grained buff limestone clouded with blue. The remainder of the county is occupied by the red or reddish-brown ferruginous sands which separate the great oolite from the subjacent lias. These are covered in many places, especially near their junction with the lias, which takes place just on the north-western border of the county, by vast accumulations of transported blocks of el. There are quarries of good building-stone at Ket- between Stamford and Uppingham, just on the border district occupied by the great oolite.

dshire belongs chiefly to the basin of the Wash. The Welland, one of the rivers flowing into that æstuary, skirts the county on the south-east side, between Rocking- and Stamford, separating it throughout from Northamp- ire. This river is not navigable above Stamford, where it quits the county altogether. The river Guash, or Wash, within the border of Leicestershire, and flows east- ough this county into Lincolnshire, where it joins lland just below Stamford. The river Chater also in Leicestershire, and flows parallel to the Wash: it the Welland just above Stamford. The Eye brook bounds the county on the south-west, and joins the Welland just below Rockingham.

The Wreak, which joins the Soar, a feeder of the Trent, rises in Rutlandshire near Oakham, and flows northward through the vale of Catmoss into Leicestershire; it drains a small district in the north-west part of the county, which is thus included in the basin of the Humber.

The Oakham canal is a prolongation of the Melton Mowbray navigation, from Melton Mowbray in Leicestershire to Oakham. It follows a circuitous course, passing through the vale of Catmoss, and has a total length of fifteen miles, of which about six miles and a half are in Rutlandshire, all on the same level.

The principal roads are, the mail road from London to Melton Mowbray, and the Great North road. The former enters the county on the south side just beyond Rockingham in Northamptonshire, and runs northward through Uppingham and Oakham into Leicestershire. The Great North road crosses the eastern side of the county between Stamford and Grantham. A road from Leicester to Stamford crosses the county from west to east, passing through Uppingham, and following the valley of the Welland; and two roads run from Oakham into the Great North road, one at Stamford, the other at Stretton between Stamford and Grantham.

Agriculture.—The county of Rutland, although the smallest in extent in England, is of some importance in an agricultural point of view. The climate is that of the midland counties of England, and differs in no perceptible degree from that of the surrounding counties of Leicester, Northampton, and Lincoln. Compared with the larger counties, it is altogether a small district, containing only about 90,000 acres of land; but as a proof of the state of the cultivation, it is observed in the 'Agricultural Report to the Board of Agriculture' in 1808, that there is little or no waste land in the county. Of the whole surface, one-half was then in pastures, only about one-thirtieth in woods, and in the whole county only 30 acres of waste, which probably are long since cultivated in some way or other. Rutlandshire is one of the grazing-counties, in which much attention has been paid to rearing choice animals, both oxen and sheep. There are many wealthy proprietors in the county, who more or less encourage agriculture in all its branches. The soil is mostly of a good quality; and the face of the country agreeably diversified, affording good sites for country-seats, parks, and pleasure-grounds: and the richness of some of the natural pastures have no doubt made it, from an early date, the residence of the richer clergy and gentry. The best pastures are on the lias clay, which, with a portion of oolite, red sand, and magnesian limestone, form the principal soils of the county. The pastures are very similar to those of Northamptonshire, and there is no great peculiarity in the cattle and sheep bred or fed in them. The pure short-horns are the general favourites with those who pay particular attention to their stock; and the crosses with these are so frequent and repeated, that no other breed can be considered as so well established, they having almost entirely superseded the long-horns. There are however other breeds to be frequently met with, bred in other parts of the country, and purchased for the sake of grazing, such as a few North Devon, Hereford, and Scotch oxen. The milch-cows are chiefly short-horns.

There are some low meadows subject to be flooded along the rivers Welland, Guash, and Chater. The first of these having but little fall, the water goes off very slowly from the flat meadows by the side of it; hence the herbage is not of the best quality, and sheep fed there are apt to rot, which they seldom or never are subject to in the upland pastures. Few attempts have been made to produce regularly irrigated water-meadows. It is the opinion of graziers that the good pastures in this county will produce from 40 to 50 stone of meat per acre every year, which gives a return of 6*l.* or 8*l.* per acre gross. The rent consequently may fairly be reckoned worth from 50*s.* to 4*l.* per acre, including poor-rates and tithes. But no such rent is paid for any considerable portion. The farms were formerly of small extent, but they have been increased by joining two or more into one occupation.

The sheep are chiefly of the improved Leicester breed. There are a few flocks of South-downs; but on the richest pastures the Leicester are the most profitable, although the South-down wethers, when moderately fat, produce by far the best mutton. This is the reason why many opulent proprietors prefer them; while the farmers, for profit, keep the Leicester, which fatten rapidly and at an early age. The improved mode of feeding sheep with turnips cut into long strips by a machine, assisted with corn or oil-cake, is gradually gaining ground on the best farms, and is one of the greatest improvements introduced of late years. The housing, or at least sheltering, the sheep, especially the breeding ewes, in wet and inclement weather, is not yet sufficiently attended to; nor is the saving in food by this means sufficiently appreciated by the farmers. There is however a spirit of improvement abroad which cannot fail to produce rapid advances in all branches of husbandry.

The farm horses are not of the most active kind, although they are large, and some very strong dray-horses have been bred in the county, and sold to dealers for the London market after having been moderately worked for a year or two. But for general farm-work they are far inferior to the Suffolk or to the active Clydesdale horses. Farmers do not always consider that time is money, and that he who can perform his work in the least time, at the same expense, has more time left for additional work. In harvest, especially, a team which will go with a loaded cart or waggon at the rate of three miles or more in an hour, and trot back empty six miles in the hour, will clear a field twice as soon as those which move little more than two miles in the hour either way.

There being no very considerable dairies in the county, no particular breed of pigs is peculiar to it. The hogs which are fatted are mostly of the Berkshire or Suffolk breed. Some gentlemen and farmers have taken pains to improve their breeds by crosses with the Chinese and Neapolitan; and these two superior breeds have been so frequently used of late years to render the native breeds more prolific and finer in the skin, that very few fine pigs are to be met with without some portion of Chinese or Neapolitan blood in them; and the infusion of a little foreign blood has considerably increased their aptitude to get fat, while some attention to the shape and smallness of the bone has produced a very manifest improvement in general.

The arable land was formerly but indifferently cultivated, as was the case in most parts of the country where grazing was the principal object of the farmer: but by the enclosure of common fields, and the extended cultivation of turnips, of which the value for the cattle in winter is now fully appreciated, a much greater quantity of corn is produced than would, at one time, have been thought possible; and by means of under-draining and an improved husbandry, the land which will produce good crops of turnips, especially the Swedish, is daily increasing.

The plough in general use is one with two unequal wheels attached to the beam, which has of late received the name of the Rutland plough, although it is common to all the adjoining counties. It is often drawn by three horses; but the best farmers begin to use only two, and find, that, if the ground be occasionally stirred to a considerable depth by the subsoil plough, and heavy scarifiers, with four, or even six horses, all the common ploughings, even in the heaviest soils, can be accomplished with a light plough and two horses abreast; and that the work is done better, more rapidly, and at less expense. The course of crops varies according to the nature of the soil; on the lighter soils, turnips, barley, and clover are succeeded by wheat, with an occasional crop of peas. On the heavier, oats and beans are introduced instead of barley or peas, with a naked fallow. The best farmers avoid two white crops in succession; but those who are tempted, by the apparent profit, to have barley after the wheat, and some of the old school cannot resist it, on fine rich soils, find, that what they have apparently gained by a catch crop, as it is called, is dearly paid for in the end, by the deficiency in those which come after, especially the clover and turnips, two crops which never are so sure and so profitable as on land which is in very good heart.

There are several extensive woods in Rutlandshire, containing fine oak, ash, and other timber. The amount of the whole is stated, in the survey in 1808, at nearly 3000 acres. But they have not improved since that time: the high price of timber during the war has caused many of the finest trees to be cut, and there is now little timber fit for navy purposes in the county; and there being no wastes, the planting has been confined to ornamental plantations. There is a considerable quantity of coppice-wood, which is cut every twelve or sixteen years; and it is the opinion of some very experienced surveyors, that a well managed coppice, with a few trees interspersed, is much more profitable than a close plantation of oaks, however well managed, when the rapid growth of the coppice-wood is taken into consideration. Ash, chesnut, whitethorn, and hornbeam are the sorts to be preferred for a coppice.

In some places allotments of land have been let to cottagers, which, where it has been judiciously done, has added much to their comfort, and stimulated industry by giving employment to women and children.

The following fairs are held in Rutlandshire:—Oakham, first Monday after Plough-Monday; Monday after February 14; Monday after April 6; May 6; Saturday in Whitsunweek; last Saturday but one in July; Monday after August 13; September 9; Monday after October 11; Monday after November 11; second Monday in December. Uppingham, March 7; July 7.

Divisions, Towns, &c.—The divisions of the county are as follows:—

Name.	Situation.	Area in Acres.	Pop. 1831.
Alstoe Hundred .	North .	27,900	4,275
East do. .	East .	20,300	3,466
Martinsley do. .	Central .	14,580	3,779
Oakham Soke .	West .	18,140	4,329
Wrandyke Hundred	S. and S.E. .	16,580	3,545
		97,500	19,385

There are only two market-towns, Oakham and Uppingham.

Oakham, or Okeham, is in Oakham Soke, in the vale of Catmoss. It had an antient castle, erected probably by Walcheline De Ferreris, a younger branch of the [illegible] of de Ferrars, to whom Henry II. had granted the [illegible]. The manor and castle repeatedly reverted to the cro[illegible] [illegible] were again repeatedly granted. Among the [illegible] them were: Richard, king of the Romans, br[illegible] III.; Edmund, earl of Kent, brother of Edward II.; [illegible] Vere, earl of Oxford and duke of Ireland, favourite of Richard II.; Thomas of Woodstock, uncle to the same king; Humphrey, duke of Buckingham, the [illegible] victim of Richard III.; Thomas Cromwell, earl of [illegible] and George Villiers, duke of Buckingham, the [illegible] profligate favourite of Charles II. Of this castle, the [illegible] hall, in which the assizes are held, and the other [illegible] of the county and the town transacted, is a [illegible] other parts are in ruins. The architecture is of [illegible] or very early English. The gate of the castle-yard [illegible] interior of the county-hall are covered with horse[illegible] lord of the manor being authorized by antient [illegible] custom to demand of every peer, on first [illegible] the lordship, a shoe from one of his horses, [illegible] money to purchase one in lieu of it. Some o[illegible] are gilt, and stamped with the donor's name. [illegible] are shoes given by queen Elizabeth, by the [illegible] York, and by George IV., when prince regent.

The number of houses in the parish, in 1831, [illegible] habited by 524 families, beside 29 uninhabi[illegible] 10 building. The population was 2390, about [illegible] agricultural. The area of the parish is 3130 acres. [illegible] town consists of neatly-built houses. The chur[illegible] edifice, mostly of perpendicular character. It [illegible] tower and spire; the latter is said to have been erected [illegible] Roger Flore, who died A.D. 1483. There is a lib[illegible] nected with this church, of about 200 vols. folio, [illegible] chiefly of the decrees of councils, the [illegible] scho[illegible] and other divines. There is a school-house [illegible] yard for the richly endowed grammar-school, [illegible] with it is a building originally used as an hosp[illegible] men, but now occupied by the master of [illegible] school and his boarders. There are meeti[illegible] Wesleyans, Independents, and Baptists. [illegible] is a [illegible] and house of correction for the county in an [illegible] the castle.

The Oakham canal affords facilities [illegible] town with coal, and for sending corn to the [illegible] districts. The market, which is on Saturday, [illegible] corn-market; and there are three yearly fairs o[illegible] stitution, and eight of modern date, for cattle. [illegible] and quarter-sessions are held here; and the [illegible] of tion for the county members. It is the only p[illegible]

The living is a vicarage united with the [illegible] Langham, Brooke, and Silverstone, of the clear [illegible] of 918*l.*, with a glebe-house, in the gift of the dean and chapter of Westminster.

There were, in 1833, twelve day-schools, with 365 children; including the grammar-school with 40 boys, and a national-school with 54 boys and 30 girls. There were three Sunday-schools, with 255 children, besides the national school, the children of which attended also on Sunday.

Jeffrey Hudson, the well-known dwarf (introduced by Sir W. Scott, in his 'Peveril of the Peak'), was born at Oakham, A.D. 1619.

Uppingham is in Martinsley hundred, six miles south of Oakham, at the intersection of the Melton mail-road with the cross-road from Leicester to Stamford. The area of the parish is 1210 acres. It had, in 1831, 342 houses, inhabited by 358 families, and 7 houses uninhabited. The town consists chiefly of one street, tolerably well paved, with an open area in the centre. The houses are in general good, and the appearance of the place is superior to that of Oakham. The church is large, with a lofty spire, and contains several interesting portions. The free grammar-school house is a neat and plain building, at one end of the churchyard; and there is an hospital for poor men. These institutions, which are well endowed, were, as well as the grammar-school and hospital at Oakham, founded by Robert Johnson, archdeacon of Leicester, A.D. 1584. There are two dissenting meeting-houses.

The population of Uppingham, in 1831, was 1757, about one-fifth agricultural. There is a market on Wednesday; and there are two yearly fairs for horses, cattle, and sheep, and coarse linens. Races are held on a course called the Brand, just south of the town.

The living is a rectory, of the clear yearly value of 661*l.*, with a glebe-house, in the gift of the bishop of London.

There were in 1833 six dame-schools, with 90 children; six other day-schools, with 266 scholars, including the free grammar-school with 32 boys, and a national school with 100 boys and 66 girls; and two Sunday-schools, with 161 children.

Divisions for Ecclesiastical and Legal Purposes.—The county is included in the archdeaconry of Northampton, and diocese of Peterborough. It comprehends the rural deaneries of Alstow, Oakham-Soca, Rutland or Martinsley, East Hundred, and Wrandike. These divisions are coincident or nearly so with the hundreds of the same name. The number of parishes is given in the Population Returns at 52; the number of benefices is given by Mr. Brewer (*Beauties of England and Wales*) at 49, viz., 31 rectories, 12 vicarages, and 6 chapelries.

The county is included in the Midland Circuit; the assizes and quarter-sessions are held at Oakham, where is the county gaol.

Rutlandshire returns two members to parliament; they are elected and the poll taken at Oakham. There is no other polling-station.

History and Antiquities.—This county appears to have
luded in the country of the Coritani; and upon the
conquest of Britain was included in the province of
Caesariensis. A Roman road, generally consi-
, though Blore disputes it, to be Ermine-street, crossed
eastern side of the county in the line of the present
th road, and a Roman station appears to have existed
Great Casterton, which is just within the boundary of
county, in the neighbourhood of Stamford; but anti-
ries are not agreed as to which of the Antonine stations
o be identified with. There are some remains of the
nt on the south-east side of the present village;
square, and had an area of about 27 acres, and was
ded on the south and west sides by the river Wash.
-street may be traced in the form of a raised bank
five feet high.

the Saxons this county was included in the king-
of Mercia. From them it appears to have derived its
of Rutland, in Domesday 'Roteland,' which was
given first to a part only of the present county.
trict of Roteland, which was crown land, had been
hed by Edward the Confessor to his queen Eadgith
dith for her life, and, after her decease, to the abbey at
er. William the Conqueror however resumed
leaving the tithes to the abbot and monks, and
ng the greater part of the land among his followers.
reign of John, Rutland, then first mentioned as a
was assigned to his queen Isabel as part of her
In the reign of Edward II. the crown appears to have possessed East Hundred, Martinsley, and Alstoe Wrandyke belonged to the Beauchamps, earls of Warwick Oakham Soke is not mentioned, and is supposed to have been included in Martinsley hundred. An earl of Rutland is mentioned in a charter of Henry I., but nothing is known of him. The first known earl was Edward, eldest son of Edmund of Langley, who was the fifth son of Edward III. The title was inherited by Richard, duke of York, and by his son, a boy of twelve years of age, who was stabbed by Lord Clifford, after the battle of Wakefield, in which Richard himself fell, A.D. 1460. The earldom was revived by Henry VIII., and conferred on the family of Roos: it afterwards came to the Manners family, in whose favour it was raised to a dukedom, which still exists. Few incidents of historical interest are connected with this county. Wright, in his 'History of Rutland,' mentions that in 1016 a battle of doubtful issue was fought between the Danes and the Saxons, but the account is at least very doubtful. In A.D. 1381, Henry Le Spencer, bishop of Norwich, assembled a force at Burley in this county to suppress the insurrection of the commons in Norfolk, under John the Litester or Dyer. [NORFOLK, vol. xvi., p. 270.] And in 1468 (according to Grafton's Chronicle), the Lincolnshire insurgents under Sir Robert Welles or Wells were defeated with great loss by Edward IV., at Hornfield in Empingham parish, in this county, beyond Stamford. It may be well to notice here that Grafton ascribes the rebellion to the instigation of the earl of Warwick; and makes the execution of Lord Wells, the father of Sir Robert, the consequence, and not the cause of the rising. [Compare LINCOLNSHIRE, vol. xiv., p. 15.] The battle is commonly known as the battle of Lose-coat-field, from the fugitives throwing off their coats in order to escape more swiftly.

The antiquities of the county are chiefly ecclesiastical. Tickencote, Little Casterton, Empingham, Essendine, and Ketton churches, all on the east side of the county, go back to the Norman period. Tickencote has been a very curious specimen of enriched Norman, but it was rebuilt in 1792, and only the elaborately ornamented arch between the nave and chancel, and part of the groining of the chancel; with the font, remain. Before it was rebuilt, it had attracted much attention, and some antiquaries regarded it as of early Saxon date. The church at Little Casterton has a nave, aisles, and chancel, with a gable for two bells at the west end: the piers and arches are late Norman, and the form of the capitals resembles the Roman. The other parts of the church are of various later dates. Empingham church has a nave with aisles, and a transept, with a tower and spire of good composition. The piers and arches of the church are late Norman or early English; the chancel, transepts, and lower part of the tower are early English. Essendine is a small church, with nave and chancel, and a gable for two bells at the western end: the architecture is partly Norman, partly early English: the south door is Norman, enriched with zig-zag moulding and other ornaments. Under the arch are three figures in relief, representing the Saviour supported by two angels: there are sculptures on each side of the door. Ketton is a large cross church, with a tower and lofty spire at the intersection: though some Norman features are intermingled, its general character is early English. The spire, which is ribbed at the angles and perforated by twelve windows, is nearly 180 feet high, and of beautiful proportions. Of Pickworth church there remains a beautiful arch or doorway, with clustered pillars, the capitals of which are adorned with elegantly carved foliage. Ryhall church has a tower and spire of early English, with some singular features.

(Blore's *History of Rutlandshire; Beauties of England and Wales;* Rickman's *Gothic Architecture; Parliamentary Papers.*)

STATISTICS.

Population.—Of 4940 males aged twenty and upwards, only twelve were, in 1831, employed in manufactures, or in making manufacturing machinery. Rutlandshire ranks third in the list of agricultural counties, and of the abovementioned 4940 males, there were 2763 engaged in agricultural pursuits in 1831, namely 1910 as labourers, 429 as occupiers employing labourers, and 424 as occupiers who were not employers of hired agricultural labour.

The population of the county in each of the following decennary periods, was,—

	Males	Females.	Total.	Increase per cent.
1801	7978	8378	16,356	
1811	7931	8449	16,380	0·14
1821	9223	9264	18,487	12·86
1831	9721	9664	19,385	4·85

showing an increase of 3029 between the first and last periods, or 17¾ per cent., the increase for England and Wales in the same period being 57 per cent.

The following table presents a summary of the population of each hundred, as taken in 1831:—

HUNDREDS.	HOUSES.				OCCUPATIONS.			PERSONS.			
	Inhabited.	Families.	Building.	Uninhabited.	Families chiefly employed in agriculture.	Families chiefly employed in trade, manufactures, and handicraft.	All other Families not comprised in the two preceding classes.	Males.	Females.	Total of Persons.	Males twenty years of age.
Alstoe Hundred .	821	892	4	4	597	183	112	2120	2155	4275	1099
East " .	667	725	2	15	474	130	121	1774	1692	3466	868
Martinsley " .	775	821	1	13	377	299	145	1880	1899	3779	966
Oakham Soke .	917	968	12	38	418	296	254	2143	2177	4320	1097
Wrandyke " .	755	785	3	29	433	194	158	1804	1741	3545	910
Total .	3935	4191	22	99	2299	1102	790	9721	9664	19385	4940

County Expenses, Crime, &c.—In the three years 1748-49-50, the average sum expended annually for the relief of the poor was 862*l.*; in 1776 it was 2664*l.*; for the three years 1783-4-5 the annual average was 2664*l.*; and for the under-mentioned periods as follows:—

	£		s.	d.	
1801	8,276,	being	10	1	for each inhabitant.
1811	11,168,	"	13	7	"
1821	10,575,	"	11	5	"
1831	8,809,	"	9	1	"

The sum raised by the county for local purposes in the year ending 25th of March, 1833, was 12,190*l.*, of which sum 10,985*l.* was assessed on land; 938*l.* on houses; 127*l.* on mills, factories, &c.; and 139*l.* on manorial profits, navigation, &c. The expenditure for the years ending 25th March, 1834-37-40 was as follows:—

	1834. £.	1837. £.	1840. £.
Relief and maintenance of poor . .	9,008	5,619	7,246
Suits of law, removal of paupers, &c. .	237	203	6
Other local purposes	1,504	463	212
	11,204	6,285	7,464

The total saving effected in 1840, compared with 1834, was 3740*l.*, or 33 per cent. The expenditure per head with reference to the population in 1831, was 9*s.* 4*d.* in 1834; 6*s.* 5*d.* in 1837; and in 1840, in consequence of the high price of provisions, it rose to 7*s.* 6*d.* per head. The number of paupers relieved in 1839 was 1535; and in 1840 there were 1454 relieved, or 7 per cent. of the total population, being one and one-half under the average for England, and one-half the average for Wiltshire. In 1835-6 the number of bastards chargeable to parishes in the county was 1 in 242 of the total population; the proportion for England being 1 in 215, and for some of the Welsh counties less than 1 in 60. In 1830 the number of illegitimate births to the total number of births in the county was 1 in 22; the proportion for England being 1 in 20.

The county-rate expenditure amounted to 273*l.* in 1792; 477*l.* in 1801; 2020*l.* in 1811; 1296*l.* in 1821; 1192*l.* in 1831; and 966*l.* in 1838.

In 1839 the sum of 921*l.* was collected on account of church expenses, of which sum 581*l.* was derived from church-rates, and 340*l.* from various other sources, including 203*l.* from estates and rent-charges. The expenditure amounted to 874*l.*, and included 306*l.* for repairs of churches.

The statistics of the highways for the years 1812-13-14, the annual average being taken, were as follows:—Length of paved streets and turnpike roads, 63 miles; all other highways used for wheel-carriages, 254 miles; rates levied for repair of the above, 3327*l.*; composition in lieu of statute duty, 403*l.*; estimated value of statute labour performed in kind, 2032*l.* In 1839 the expenditure on the highways, estimated at 267 miles in length, was 4694*l.*, the cost of repair per mile being 17*l.* 11*s.*

The number of turnpike trusts in the county in 1834 was four. The total income was 6406*l.*, the chief items being 3757*l.* from tolls; 405*l.* parish composition in lieu of statute duty; and 1076*l.* estimated value of statute labour performed. The expenditure amounted to 6081*l.*; and there were bonded debts to the amount of 9900*l.* In 1836 the income, including money borrowed, was 5804*l.*; and the expenditure, including debts paid off, 5610*l.* The debts amounted to about two years' clear annual income (the proportion of debts for England being equal to 4¼ years' income), and the proportion of unpaid interest was 3 per cent. of the total debt, that for England being 12 per cent.

The number of persons charged with criminal offences and committed in the three septennial periods ending 1819-26-33, was 56, 83, and 102, making an annual average in each period of 8, 11·8 and 14·5 respectively. The average of the six years from 1834 to 1839 inclusive was 19·5, the total committals for the above years being 117. The numbers for each year were as follows:—

	1834.	1835.	1836.	1837.	1838.	1839.
Committed	25	15	24	27	13	13
Convicted	21	13	16	19	7	11
Acquitted	4	2	8	8	6	2

The average comparative results presented by the criminal tables for so small a population as Rutlandshire are calculated rather to mislead than afford information. For example, in 1835 the proportion of persons committed to the total population was 1 in 1292, and for England and Wales 631, but in 1837 the proportion in Rutlandshire rose to 1 in 718, the number of committals being 15 in the former year and 25 in the latter. For the last six years the average has been as nearly as possible 1 in 1000, which is a more favourable proportion than prevails in any of the eastern or southern agricultural counties. The number of females committed does not average more than 2, and in 1839 there was not one. In 1837-8-9 the proportion of instructed criminals in Rutlandshire averaged 39 per cent., which was higher than in any other county, the county of Bedford standing as low as 2·2 per cent.

The number of registered electors in the county in 1835 was 1328, and 1373 in 1840. In the latter year there were 858 voters possessing freehold qualifications; 68 copyholders; 9 leaseholders for lives or periods of years; 327 occupying tenants at a rent of 50*l.* per annum; 24 deriving the right of voting from offices which they enjoyed; and 87 were were either joint qualifications or double qualifications.

There is no savings'-bank in the county.

Education.—The summary from the Returns to Parliament in 1833, in obedience to circulars issued to churchwardens and other local authorities throughout England and Wales, might be omitted in the case of this county, a much more complete statistical inquiry having taken place in 1838, under the direction of the Manchester Statistical Society; but for the purpose of comparing the result of the official inquiry with the one last mentioned, the former is given in an abridged form.

	Schools	Scholars.
Infant-schools . . .	10	
Scholars, aged from 2 to 7 years .		173
Daily schools . . .	102	
Scholars, aged from 4 to 14 years .		2707
Total daily schools . . .	112	
Total scholars under daily instruction		2880
Sunday-schools . . .	56	
Scholars at such schools, aged from 4 to 15 . . .		2733

apparent defect in the official returns arises ossibility of ascertaining the number of duplis of scholars who attend both day and Sunday consequently the numbers who are not receiv-ucation at all cannot be determined. The above rn for Rutlandshire is believed to be more accuany other county. The corrections are therefore y would be in other cases. The following state-en from the Report of the Manchester Statistical :—The population of the county, in 1838, was estit 20,000, and the number of children between 5 years of age at 5000. Of these 3561 were found to ng either at day or Sunday schools, leaving 1439, 29 per cent., not receiving school instruction. the scholars of all ages, it was found that 1117, or ·6 per cent. of the population, attended day and schools; 1922, or about 9·6 per cent. of the poputtended both day and Sunday schools; and 1274, or ·4 per cent. of the population, attended Sunday-only. The dame and common day schools were l by 6·25 per cent., and the endowed or charity schools per cent., of the total population. Out of 46 parishes ts in the county there were only 7 parishes and ets without a Sunday-school. Out of 140 schools, had been established since 1801; 63 schools had nmenced from 1830 to 1838; and 58 from 1801 to 1830. The following 'General Summary of Schools and Scholars in the county of Rutland in 1838' is appended to the Manchester 'Report' (p. 315, vol. ii. of the *Journal of the Statistical Society of London*).

In another 'Report' of the Manchester Statistical Society, 'On the Condition of the Population in Three Parishes in Rutlandshire, in 1839,' it is stated that 75 persons per cent. were able to read, and 44 per cent. could write, in one parish, and in the two other parishes it was found that the proportion of the former was 81 per cent., and of the latter 50 per cent. On the whole, Rutlandshire may be regarded as considerably in advance of other counties. In the 'Second Annual Report of the Registrar-General,' the number who signed with marks in attestation of marriages is given as 33 per cent., while in Bedfordshire the proportion was 60 per cent. Little however has been done throughout the county to extend education beyond reading and writing or to develop the intelligence of the people. The Manchester 'Report' states that 'want of books is a very serious impediment to the usefulness of the schools.' The books most commonly found in the cottages in the three parishes which the Society made the subject of a separate inquiry were Fox's 'Martyrs;' Fleetwood's 'Life of Christ;' and Venn's 'Whole Duty of Man.' Few cottages were entirely destitute of books, but they were almost exclusively religious works.

General Summary of Schools and Scholars in the County of Rutland, 1838.

	AGE.			SEX.		TOTAL.		PER CENTAGE.		
stimated Population, 20,000.	Under 5 years.	Between 5 and 15 years.	Above 15 years.	Male.	Female.	Schools.	Scholars.	Of the Total estimated Population.	Of the Total Number of Scholars.	Of the Total Number of Sunday Scholars.
chools—Church of England . .	229	2,077	13	1,221	1,098	55	2,319	11·60	53·74	72·56
Protestant Dissenters .	91	780	6	429	448	14	877	4·38	20·32	27·44
Total	320	2,857	19	1,650	1,546	69	3,196	15·98	74·06	100·00
	10·01 per ct.	89·39 per ct.	0.60 per cent	51·63 per ct.	48·37 per ct.					Of the Total Number of Day Scholars.
also as Day or Evening Scholars	134	1,775	13				1,922	9·60	44·49	
Sunday-school Tuition only .	186	1,082	6				1,274	6·38	29·57	
ls—Dame-schools	249	429	..	277	401	50	678	3·39	15·71	22·87
Common Boys' and Girls' Schools	77	463	..	272	268	25	540	2·70	12·52	18·22
Superior Private and Boarding Schools	4	125	7	85	51	9	136	0·68	3·15	4·59
Supported solely by the Scholars	330	1,017	7	634	720	84	1,354	6·77	31·38	45·68
Endowed and Charity Schools wholly or in part supported by the Public .	154	1,419	37	941	669	49	1,610	8·05	37·31	54·32
Total	484	2,436	44	1,575	1,389	133	2,964	14·82	68·69	100·00
	16·33 per ct.	82·18 per ct.	1·49 per cent.	53·14 per ct.	46·86 per ct.					Of the Total Number of Evening Scholars.
chools—Supported solely by the Scholars	..	13	20	24	9	4	33	0·16	0·77	44·00
Connected with Charity-hools	..	21	21	42	..	3	42	0·21	0·97	56·00
Total	..	34	41	66	9	7	75	0·37	1·74	100·00
	..	45·3 per cent.	54·7 per cent.	88 per cent.	12 per cent.					
er of Schools and Scholars .	670	3,552	91			209	4,313	21·57	100·00	
	15·53 per ct.	82·36 per ct.	2·11 per cent.							

II.I, [LATINI.]

, FREDERIC, a celebrated anatomist, was ague, in 1638. His father was secretary of the eral of Holland. He studied medicine at Leyden, tor's degree in 1664, and then returned to prac-Hague. In 1665 he published his first work on of the lymphatic vessels, and in the following year ointed to the professorship of anatomy at Amster-his time he devoted himself entirely to the study , or rather to the formation of an anatomical mu-ne s to have regarded the science of anatomy nferior to the art of preparation-making. was certainly unequalled by any of his con-s, and the accounts given by those who saw his perfect state in which the bodies of children and animals were preserved, with all the apparent freshness and bloom of life, if they could be entirely credited, would be sufficient evidence that he has not yet had a rival in the preservation of bodies. In the art of dissecting and of injecting the blood-vessels however, in which Ruysch was supposed to be equally eminent, he has long been far surpassed; and it is probable that his best preparations of this kind were not superior to those which are ordinarily made at the present day.

By unceasing labour Ruysch collected a most extensive museum of anatomical preparations of all kinds, for which, in 1698, Peter of Russia gave him 30,000 florins. It was then conveyed to Petersburg, where, it is said, the greater part has since decayed, and become useless. After selling his first museum, Ruysch commenced with unabated ardour to collect a second, a part of which, at his death in 1731, was sold to the king of Poland for 20,000 florins.

Ruysch's merits as an anatomist have been greatly overrated. In all his works, which make up five large quarto volumes, there is no evidence that he was more than a plodding anatomical artist. Though he claimed many discoveries, those that really belong to him are few and not important; and in proportion to the labour expended in the pursuit of anatomy, few have contributed less to its progress as a science, for he did not even publish the modes of making his preparations.

RUYSDAEL, or RUYSDAAL, JACOB. This great landscape-painter was born at Haarlem, in 1635. He was originally brought up to surgery, which he practised for a short time, but he appears to have painted at an early age, and eventually he adopted painting as his profession. If we may judge from a certain similarity of handling, he probably received the first instruction in his art from his elder brother Solomon, who was also a good landscape-painter, but his reputation has been lost, or rather obscured, by the superior name of his brother. Solomon was born also in Haarlem, in 1616, and died there in 1670; he was the scholar of Schoeft and Van Goyen. He distinguished himself by the invention of an admirable composition in imitation of variegated marbles.

Jacob Ruysdael became the friend of Nicolas Berghem, and, as has been reported, his scholar; but this, if we may judge from the extreme dissimilarity of their styles, is highly improbable. Ruysdael was a simple but accurate imitator of nature, and his taste inclined him towards the wild and the secluded; but he displayed an exquisite judgment in the selection of his subjects, and for the power and at the same time the truth of his imitations he has never been equalled. Woods and waterfalls are the prevailing subjects of his landscapes, and he rarely if ever painted a scene without introducing either a cascade or a rivulet. He occasionally also painted marine pieces.

Ruysdael's works, independent of their powerful effect and masterly imitation, are distinguished from those of other masters by the peculiarity that the foregrounds generally constitute the pictures, the distances being introduced simply as accessories to complete the view, and he may be said perhaps never to have produced a mere scenic effect. His colouring, though warm, as also his foliage, is that of a northern climate, and it is very improbable that he ever visited Italy; he was fond of rather cold and cloudy skies with sudden and powerful masses of light and shade. Ruysdael never painted figures; those which are introduced into his compositions were painted by Ostade, Wouvermanns, a Vandevelde, or Berghem.

His works are held in the highest estimation by good judges. There are fine specimens of them in most of the principal collections of Europe. The Stag-Hunt, in the Royal Gallery of Dresden, the figures of which are by Vandevelde, is generally reputed to be his masterpiece; but there is a large woody landscape in the Doria gallery at Rome, of surprising power and beauty, and which is certainly unsurpassed by any production of its class. Ruysdael also etched a few plates in a very bold and effective style, but impressions from them are very scarce. He died at Haarlem in 1681, in the forty-sixth year of his age. The celebrated Hobbema studied the works of Ruysdael. (Descamps; Fiorillo.)

RUYTER, MICHAEL, born at Fleissingen in 1607, went to sea at eleven years of age as a cabin-boy, and rose successively until he became a warrant-officer, and, in 1635, was made captain. He served for several years in the East Indies, and in 1645 was appointed rear-admiral. In 1647 he attacked and sunk off Sallee an Algerine squadron. In 1652 he was employed in the war against England, and while accompanying a large convoy of merchantmen he met the English fleet off Plymouth. The combat was not decisive, but Ruyter succeeded in saving his convoy. In 1653 he commanded a division, under Van Tromp, and was beaten by Blake, but he had afterwards an advantage over the English near the Goodwin Sands. In 1655 he was sent to the Mediterranean to chastise the pirates of Algiers and Tunis. In 1659, being sent by the States-General to the assistance of Denmark against Sweden, he defeated the Swedish fleet, as a reward for which the king of Denmark gave him a title of nobility with a pension. In 1665 he fought against Prince Rupert of England with no decisive result, and in July of the following year he was beaten by the English. In June, 1667, he entered the Thames as far as the Medway, and destroyed the shipping at Sheerness. In 1671, war having broken out between France and Holland, Ruyter had the command of the Dutch fleet which was to oppose the French and the English: he fought several battles in the Channel and the German Ocean, without any important result. In 1675 he was sent to the Mediterranean, and fought a desperate battle with the French admiral Duquesne, off the eastern coast of Sicily, in which his fleet was worsted and Ruyter had both his legs shattered. He effected a retreat into the port of Syracuse, where he died of his wounds, in April, 1676. A splendid monument was raised to him at Amsterdam, and G. Brandt wrote his Life, which was translated into French, Amsterdam, fol., 1698. Even Louis XIV. expressed sorrow on hearing of his death, saying that 'he could not help regretting the loss of a great man, although an enemy.'

RYAN, LOCH. [WIGTONSHIRE.]

RYBINSK, in the government of Yaroslaw, at the confluence of the Rybinka and the Volga, though a small town with only 3200 inhabitants, is a place of considerable importance. It is as it were the central point of the inland trade and inland navigation of Russia, because it is here that the goods are generally transferred from the large Volga vessels to the smaller craft which are to convey them by the rivers and canals connected with the Volga. In one year 1760 large vessels have brought goods to the value of 30 millions of rubles, and above 6000 small vessels have conveyed these and other goods (to the amount, in all, of 56 millions of rubles) to St. Petersburg. The number of strangers who visit Rybinsk in the summer is very great.

RYCAUT, or RICAUT, SIR PAUL, was the tenth son of Sir Peter Rycaut, a merchant of London. The date of his birth is unknown, but he took his bachelor's degree in 1650, at Cambridge. In 1661 he attended the earl of Winchelsea as secretary, when that nobleman went out as ambassador extraordinary to Constantinople. During that embassy, which lasted eight years, he made himself acquainted with the manners, customs, and religion of the Turks, and published the 'Capitulations, Articles of Peace, &c., concluded between England and the Porte in 1663,' and also 'The Present State of the Ottoman E Three Books, containing the Maxims of the Turkish their Religion, and Military Discipline, illustrated Figures,' London, 1668, 1670, fol. He was afterward pointed consul at Smyrna, which situation he held during eleven years, and exerted himself diligently in extending the commerce of England with the Levant.

On his return to England, Rycaut employed chiefly in literary occupations. He published 'The State of the Greek and Armenian Churches, Anno 1678,' London, 1680, fol., and a 'History of the Tur pire from 1623 to 1677,' London, 1680, fol., which tinuation of Knollys's 'History of the Turks,' and much information concerning the political resources Turkish empire and the manners of the Turks. been translated into almost all the languages of Europe, and has been several times reprinted.

In 1685 the earl of Clarendon, then lord li Ireland, appointed Rycaut secretary of the pro Leinster and Connaught, and James II. created him a councillor of Ireland, a judge of the Court of Admiralty, a knight. The Revolution of 1688 deprived him of a employments, but in 1690 he was appointed res the Hanse Towns; he then went to reside on the nent, and remained there till 1700, when he return England for the benefit of his health, and died on the December in the same year.

Rycaut was a member of the Royal Society of Lon and, in addition to his high character as a dipl celebrated for his knowledge of the learned la the modern Greek, the Turkish, Italian, Spanish,

Besides the works already mentioned, Rycaut pu a 'History of the Turks from the year 1675 to 167 don, 1700, folio; an English translation of Garcilasso Vega's 'Royal Commentaries of Peru,' London, 1688, an English translation of Platina's 'History of the P London, 1685, fol.; and an English translation of 'El ticon,' of Baltasar Gracian, London, 1681, folio.

RYE, a parliamentary borough, a seaport town, and member of the Cinque-Ports, is situated upon an at the south-eastern corner of the county of Sussex 63 miles south east from London. It is bounded on the by the river Rother, the channel of which was suddenly diverted from Romney by the tempest that overwhelmed Old Winchelsea in the year 1287, and on the south and west by the river Tillingham, which, having received the waters of the Brede immediately above the town, joins the Rother at Rye: the united stream enters the sea about a mile and a half below the town, and there forms Old Rye harbour. Rye is supposed to be the Novus Portus of Ptolemy. The derivation of its name is variously stated: Camden derives it from *Rive*, Norman (*Ripa*, Lat., a bank); Jeakes, from the British *Rhy* or Saxon *Rhee*, a ford; and the posi- n of the town in former years seems to favour the latter opinion. The earliest authentic record of Rye is of the year 893, when the Danes, under the pirate Hastinges, effected a ding near this town, and afterwards took Appuldore. Edward the Confessor gave the town to the abbot and monks of Fescamp in Normandy; but Henry III., in the -first year of his reign (1267), resumed possession of it for the better defence of the kingdom by maritime operations, and granted to the monastery in exchange the manors of Chilcenham (Cheltenham) and Selover in Gloucestershire, with lands in Lincolnshire. The town is not mentioned in 'Domesday,' but it was doubtless included in the hundred of Gheslinges, in which it is locally situated, and probably formed part of the manor of Rameslie. In the reign of Stephen, William d'Ipres, earl of Kent, erected a tower or small castle on an eminence which commands the rivers at their junction, which is still standing. It was purchased by the corporation, 10 Henry VII., and is now used as a gaol; immediately below it is a modern battery for eighteen guns. This single castle being thought insufficient for the defence of the town, Edward III. caused it to be walled on the north and west sides, the natural abruptness of the native rock, at that time washed by the sea, being considered a sufficient protection on the east and west. There were originally three gates, besides a small postern-gate. The eastern or land-gate, the only one still preserved, has a handsome Gothic arch, flanked on each side by a round tower. The town was burnt by the French in the 1st Richard II. (1377), when the greater portion of the town and the beautiful church were reduced to ashes; and again in 25 Henry VI. (1447), when the old records perished. After these attacks of the enemy, the town in the next century suffered severely from pestilence. In 1544 there were 462 persons buried; in 1563 no less than 765 died, of whom there were buried in August 105, in September 290, and in October 168, or 563 persons in three months; and again, in 1580, 592 persons died, the majority of whom were carried off in the summer months by the plague. In 1572 Rye became an asylum for the Huguenots, who were driven from their homes by Catherine de' Medici. On the 22nd November, 1572, there were 641 strangers in the town, and the arrivals continued to increase till 1582, when the French Protestant inhabitants in Rye were 1534: they remained at Rye till the latter part of the reign of James I., when they or their descendants re-embarked for France.

The condition of Rye has mainly depended upon its harbour. In the sixteenth century the harbour was nearly choked up: an act was passed (2 Edw. VI.) (1548) for amending the haven, yet it was not till the storm of 1570 reopened it that the harbour was navigable for trading ves- The sea however continued to recede, so that in the inefficiency of the port was the cause of great laint. During the whole of that century the sea led, and the bar of beach accumulated at the entrance, in 1750, all hopes of improving the old harbour being doned, it was determined to form a new mouth by canal running directly south into the sea; this work prosecuted at a great expense till 1778, when the our was found to be a complete failure, and was doned. The old harbour was once more resorted to, it has been much improved. A wooden pier of piles been constructed on the eastern side, and embankments been thrown up on the western side, leaving an inter- e entrance 160 feet in width. The average rise of g-tides is about 17 feet, and of neap-tides from 9 to 12 at the pier-head, whilst the lift in the bay is 22 feet. w-water the harbour is dry. The depth of the channel he river decreases gradually to the town, where there is feet of water at spring-tides, but during neaps seldom e than 9 feet. The approach from the bay to the en- e of the harbour is very intricate and difficult, espe- for sailing vessels, owing to the sand-banks and the tortuous course of the channel. The shingle or stone beach, which extends on both sides of the harbour's mouth, has accumulated at the entrance, owing to the winds either from the westward or eastward of south, and forms banks on each side (according to the prevalence of the wind), which, in combination with sand, shut out the sea and render the channel crooked and uncertain. The chief trade consists in the export of hops, bark, and wool, and in the import of coals, corn, timber, and Dutch produce. Lime is also burnt near the town from chalk brought from Beachy Head, and ship-building is successfully carried on.

Rye has never received a charter. It is a corporation by prescription. The town is not divided into wards. The council consists of four aldermen, and twelve councillors; the style is 'the mayor, jurats, and commonalty of the antient town of Rye.' (5 and 6 Wm. IV., c. 76.) The jurisdiction extends over nearly one-half of the parish of Rye, comprehending 1078 acres out of 2475. The mayor and aldermen, assisted by a recorder, hold courts of sessions and general gaol delivery for all offences, and a court of record for all actions real, personal, and mixed; they have also a summary jurisdiction for debts below 40*s.*

Rye returned two members to parliament from 42 Edw. III., till 2 Wm. IV., c. 45, when it was placed in schedule B, since which, in conjunction with Winchelsea and six rural parishes, it has returned one member. Rye is one of the two antient towns added to the Cinque Ports before the reign of John, and described as 'nobiliora membra quinque portuum.' [CINQUE PORTS.]

The town is pleasantly situated on the northern and eastern slopes of a hill, and consists of three principal streets running parallel to the sea, intersected by cross streets, but the houses are irregularly built. The town-hall is a neat brick building supported on arches, with a market-place beneath. The market-days are Wednesdays for corn, vegetables, fish, &c.; and Saturdays for vegetables, fish, and meat. Every alternate Wednesday there is a market for fat stock well supplied. Rye is within the diocese of Chichester; the church, dedicated to St. Mary, described by Jeakes as 'the goodliest edifice of the kind in the counties of Sussex or Kent, the cathedrals excepted,' has been patched and altered so as to spoil the general effect. The southern chancel, once a chapel dedicated to St. Clare, is used as a school-room, and the northern, formerly the chauntry of St. Nicholas, is blocked out from the body of the church. The living is a vicarage, with an average net commuted income of 410*l.* The population of the entire parish, in 1831, was 3715, and the number of inhabited houses 680. There are two schools, recently united: one a free grammar-school, erected in 1636, by Thomas Peacock, gent., one of the jurats, and endowed with the sum of 32*l.* annually; and the other, for poor children, founded and endowed by James Saunders, Esq., in 1708, with a rent-charge, now producing 116*l.* 10*s.* per annum.

(Horsfield's *History of Sussex*, 4to, 1835; Stockdale's *Sketch of Hastings*, &c.; Burrell MSS.; Lansdowne MSS.; *Parliamentary Papers*, &c.)

RYE is a plant of the family of the Gramineæ, and bears naked seeds on a flat ear furnished with awns like barley. The straw is solid, the internal part being filled with a pith, which, if it causes it to be inferior as fodder, makes it more valuable for litter, and particularly for thatching. The value of the straw is often nearly equal to that of the grain. Rye grows on poor light soils which are altogether unfit for wheat, and hence tracts of light sands are often denominated rye-lands. On these soils this grain is far more profitable than wheat, which can only be raised there at a great expense of marling and manuring. The value of rye in those countries where it forms a considerable portion of the food of the labouring classes, is from two-thirds to three-fourths of that of wheat. From experiments made to ascertain the quantities of nutritious matter in rye and wheat, Thaer states their real comparative value to be as 64 to 71. It was formerly raised in considerable quantities in England, either alone or mixed with wheat, and was then called *meslin*, from the old French word *meslé*, which means *mixed*. The meslin when ground produced a very wholesome and palatable household bread, and it was thought advantageous to sow the two sorts together, from the notion that if either failed there would still be a crop of the other. This however was an error. No doubt the wheat would often fail on inferior soils when the rye would thrive; but the reverse was seldom or never the ease; and besides the rye comes to maturity at least a fortnight before the wheat. If the soil is capable of bearing a moderate crop of wheat, it would be much more advantageous to sow one portion of a field with rye and another with wheat; and if meslin bread is desired, the two grains may be mixed in any required proportion. Excellent bread is made of two parts of wheat and one of rye ground together, with only the coarse bran sifted out. Rye is at present raised in very small quantities in England. By examining the averages taken for the purpose of regulating the duty on the importation of corn, the quantity of rye sold is insignificant compared with that of other grain. Except at the time when it is sown for the purpose of affording green food for sheep and horses in spring, there is no demand for rye in the markets. In the Return now before us, made January 8, 1841, for the preceding week, the quantity of wheat sold is stated to be 68,990 quarters, and of rye only 258; and while the average price of wheat was 3*l.* 1*s.* 9*d.*, and barley 1*l.* 13*s.* 6*d.*, that of rye was only 1*l.* 12*s.* 6*d.*, which is much below its comparative value, according to Thaer's experiments, either to make bread of its flour or to distil a spirit from it.

Rye is extensively cultivated on the Continent, especially in the Netherlands, where it is the chief grain from which the spirit commonly called Hollands is distilled, which is flavoured with juniper, in Dutch called *Genever*, whence the name of *geneva* and its contraction *gin*. When malted it makes excellent beer, one bushel of rye malt being equal to at least one and a quarter of barley malt. The cultivation of rye is very simple; it is usually sown after wheat, where the soil is light and rich, or after turnips and potatoes, in those soils which are not strong enough for wheat. As it is ripe in June or July, turnips are often sown immediately after; and by the manure produced by these, as well as their effect on the soil, a second crop of rye can be obtained the ensuing year. This is no doubt contrary to all sound theory; but such is the practice in Flanders, and they do not find that their crops diminish in consequence.

In England rye is mostly sown as a green crop, and when fed off early in spring with sheep, the land is invigorated, and will bear excellent potatoes or turnips the same year. This practice cannot be sufficiently recommended; and if the rye is sown very early in autumn, it may be fed off in October and November, when sheep-feed is beginning to fail and the turnips have not yet attained their full size, without any detriment to the succeeding spring produce.

Winter barley and winter oats have been substituted for rye as spring fodder by some farmers; but on land of moderate quality rye is generally preferred. It bears the severest winters, which is not the case with barley or oats. The rye which has been fed off very early may be allowed to remain for seed, which it will produce more or less abundantly, according as it has been fed off earlier or later.

The preparation of the land for rye is the same as for wheat, except that in very light soils no more ploughings are required than will clear the ground of weeds. If rye is sown after harvest, one ploughing only is usually given. It will thrive upon rich wheat soils, as well as upon lighter, and, as it throws out numerous stems in rich land, it is the more profitable as fodder, although the crop of grain might not be so abundant when the plants are too much crowded. To have as much green food as possible, the rye is always sown broadcast, three bushels at least to an acre; some sow a sack, and with advantage. It is also usually sown amongst winter tares, which the stems of the rye help to keep up from the ground: half a bushel of rye to three bushels of tares is a fair proportion; some farmers sow wheat instead of rye, as being stronger in the stem, but besides its being more expensive, it does not shoot so early as rye, nor is it so much stronger in the green stem, as is supposed. Oats are invariably sown amongst spring tares, and answer the purpose well.

There is a variety of rye mentioned by continental authors by the name of *Seigle de la St. Jean*, or St. John's-day rye, because it grows so rapidly that, if sown about St. John's Day (24th June), it will be fit to mow green by the middle of September, and in favourable seasons may be fed off again in November, without preventing its giving ample feed in spring, and a good crop of grain at the next harvest. It might be advantageous to introduce this variety into England, if it be not already known. There is no doubt that there are varieties of the same kind of plants which have a much more vigorous vegetation than those commonly cultivated; and the introduction of them where they [illegible] not known is an important benefit to agriculture. [illegible] celebrated agriculturist Du Hamel du Mo[illegible] an individual who had obtained, from one sowing [illegible] abundant cuts of green rye for cattle in two years. [illegible] green plant is cut down before the fructification is [illegible]pleted, it will in general throw out fresh stems; [illegible] very rich soils its blossoming may thus be continually retarded, until the roots become too weak to force succeeding stems.

When the land is in good heart and clean after wheat-harvest, it may be expeditiously cultivated by means of a strong scarifier, such as that lately invented by Mr. Biddell, or some similar instrument, which opens the soil several inches deep, without turning it over; and rye may be sown immediately, without using the plough. This is an immense saving of time and labour, as four or at most six horses will completely stir ten acres of land in a day, which may thus be immediately sown before the wheat is out of the field, or fit to be carried. A week gained in the time of sowing may make all the difference between a crop which can be eaten off before winter and one which will only be fit for the sheep in the succeeding spring. The weeds which may spring up with the rye will either be choked by its luxuriance, or at all events will never shed their seeds, being mown or fed off with the rye, and the roots ploughed in the next year. The large perennial roots will thus be more easily taken out by the harrows, and all the annual weeds will be destroyed.

Although the value of rye as a green crop is fully admitted in England, very little is grown for food or distillation, yet on some poor soils, where wheat and barley are now often sown with a very poor return, and at a great expense of manure, rye and buckwheat would give a much greater clear profit, and would require much less manuring: and where there are not ready means of improving the soil by claying or marling, the cultivation of rye would be found most advantageous; and, by means of sheep, very poor sandy soils might thus be made profitable.

Rye is subject to most of the diseases which attack the plants of the family of the Gramineæ, such as rust, mildew, burnt ear, and smut-ball. These diseases are described in the article WHEAT. But there is one remarkable disease, which, although sometimes found in wheat, is much more commonly observed in rye. It is called the *ergot*, the French name of a cock's spur, which the diseased grain resembles in shape. [ERGOT.] By some perversion of the vital functions of the plant, the embryo or germen, instead of [illegible] into a regular seed filled with farina, shoots out a long fungus-like substance, several times the length of a co[illegible] seed, which rises above the chaff, and has the appeara[illegible] a slender pyramid, slightly bent on one side. This s[illegible] is soft, and easily broken or cut, and is unifo[illegible] nal texture, without any husk or skin over [illegible] merely the loss of the grain of which the ergot takes [illegible] the mischief occasioned by this disease would be c[illegible]tively trifling, but this fungus, when taken internally [illegible] with the rye flour converted into bread, has a most [illegible] and deleterious effect on the animal frame. When [illegible] any considerable quantity, it produces the most dre[illegible] eases. This was first observed in France, where a scarcity from the failure of the crops, accompanied [illegible] more than usual production of the ergot in rye, [illegible] poorer inhabitants of certain districts to make b[illegible] diseased rye. The consequences were horrid to [illegible] their limbs rotted and separated from the [illegible] death relieved them from their misery. T[illegible] ascribed it to witchcraft, but experiments made [illegible] by feeding them on ergotted rye, soon showed the [illegible] A similar effect is recorded, and supposed to have [illegible]duced by the ergot of wheat on a family in the [illegible] Wattisham, Suffolk, in 1762, of which an acc[illegible] in the 'Philosophical Transactions' for 1762, [illegible] mentioned by Professor Henslow, of C[illegible] on the diseases of wheat, in the 'J[illegible] Agricultural Society of England' (vol. [illegible] 1, [illegible]

The extraordinary effects of the ergot of rye hav[illegible] the subject of experiments in medicine, a[illegible] found extremely useful in certain cases o[illegible]bour. It is consequently become an article of [illegible] a drug, and imported from the Continent. By [illegible] observation of the circumstances which fav[illegible] in the rye, it might be profitable to culti[illegible] or the ergot it produces. The seed which grows on e ear with the ergot might be selected for seed, and et soil, with an ungenial aspect, might be chosen as ely to perpetuate the disease. The ergot is sold by s at from ten to twenty shillings per ounce, so that, pound of ergot could be collected, it would be worth an the produce in sound grain of an acre of the best At all events, it will well repay the trouble of picking he ergot from the rye, where it is infected, and it is scovered, before reaping, from its prominence and lour.

GRASS, sometimes called *Ray-Grass*, is one of the nmon of the artificial grasses; it is of the family of *mineæ* of the genus *Lolium*. There are several , some annual and others perennial, some producing juicy grass, and others a small diminutive plant. rieties arise chiefly from difference of soil, climate, ivation. In the convertible system of husbandry, performs a very essential part, especially the l sort, which, mixed with different varieties of nd other grass-seeds, produces a rich and close herich may be either mown for hay or depastured. In se of two or three years the land is so much rey the extention of the roots, and by the dung and the animals, that, without dung from the yard, it luce one or two very good crops. When clover is remain only one year, the annual variety of ryerequently sown with it. It adds to the weight of and the stems of the rye-grass are a good corrective hness of the clover, when they are given to horses n state; but when the hay is intended for the Lonket, or that of any of the great mercantile towns, esmen and carmen prefer the pure clover hay, it more nutritious. Some farmers also who cultiir land on the Norfolk system, have a prejudice ye-grass, as being unfavourable to the succeeding wheat. Accordingly, when they have a layer of , instead of clover (because the clover, having been repeated, fails in the end), they often take peas or tween the rye-grass and the wheat. This accords ry; for when the rye-grass completes its fructifican if the seed is not ripe, it has a deteriorating effect oil similar to that of a white crop, and therefore a us crop should succeed it. Many farmers, without le to give any reason, assert, from experience alone, at taken after rye-grass is more subject to accident than after red clover. This is not the case when grass has been depastured, but in the convertible generally adopted in Scotland oats are usually en the grass is broken up, because an abundant btained on a single ploughing; and the land reirring to produce a good crop of wheat, which is preference after beans or early turnips.

nt varieties of rye-grass have been recommended at imes; one which goes by the name of *Pacey's* rye kept its reputation as a perennial grass for a long he *Italian rye-grass*, well known in the South of n Switzerland, and in Germany, is a native of Lomhere it grows most luxuriantly and rapidly by irrigation. There is no grass which so soon forms neadow. It has been brought into notice in Engin a few years, in consequence of small parcels of having been brought over by individuals who adqualities; and it has borne the cold and wet winritain better than might have been expected. On t land it grows most rapidly and luxuriantly. It several cuttings in a season. The writer of this s had two perfect crops of seed from the same plants ar, the first in June and the second in October, both ripe and heavy. Those who have paid attention to vation of rye-grass think highly of it. This grass uch more rapidly in spring than any other grass, much relished by cattle, that they scarcely allow a em to spring up. A small space in a layer being h Italian rye-grass, may be distinguished in the y its superior green colour and its very close pile; cattle will always be found there, as long as there st bite for them. It may be advantageously sown n with the Trifolium incarnatum, and together give much early green food in spring. It may be n, whether this is preferable to sowing rye; but it variety, and on some soils may produce earlier and undant feed for lambs. When Italian rye-grass is sown by itself, and allowed to go to seed, it becomes thin after the first year, from many of the plants dying off: it may therefore be prudent to mix some other kinds of grasses with it, which will supply its place where it is worn out. It is a most excellent practice to sow Italian rye-grass on old meadows and pastures, at the time when they are recruited with compost or earth. If they are well harrowed or scarified, and the rye-grass be sown before the roller goes over them, the succeeding crop of hay will be much increased in quantity and improved in quality. On water-meadows, which require renovation, this grass is invaluable, being early, rapid in growth, and very abundant when irrigated. We have seen hay made in July from a newly made water-meadow sown with Italian rye-grass in March. This was at Mr. De Fellenberg, at Hofwyl, near Berne, in Switzerland. Mr. J. Rodwell, at Alderton Hall, near Woodbridge, in Suffolk, cultivates the Italian rye-grass for seed to a large extent, and with great success.

RYE-HOUSE PLOT. [Russell, Lord Wm.]

RYE, SPURRED. [Ergot.]

RYMER, THOMAS, the learned editor of the great collection of documents relating to the transactions of England with foreign powers, popularly known as 'Rymer's Fœdera,' was one of many sons of Ralph Rymer, of the neighbourhood of Northallerton, who had rendered himself obnoxious to the Royalists in the Commonwealth times in his office of Sequestrator, and becoming implicated in the northern insurrection of 1663, was thereupon executed. Thomas was born in 1638 or 1639, and educated under an excellent schoolmaster at the grammar-school of Northallerton, where he was class-fellow with the learned Dr. George Hickes. He was removed to Sidney College, Cambridge, and was entered of Gray's Inn in 1666.

He does not appear to have attained any eminence in the law. He rather devoted himself to polite literature, till he was named the historiographer royal, and appointed editor of the 'Fœdera.' His first publication is a play, published in 1677, entitled 'Edgar, or the English Monarch.' This was followed in the next year by his letter to Fleetwood Shepherd, 'The Tragedies of the Last Age considered and examined by the Practice of the Antients and by the Common Sense of all Ages.' In 1683 appeared his translation of the Life of Nicias, by Plutarch, which is found in the collection of the 'Lives translated into English by several Hands.' In 1684 he published a tract on the antiquity, power, and decay of Parliament, which was reprinted in 1714, on occasion of the expulsion of Richard Steele, Esq., the member for Stockbridge. In 1693 he published 'A short View of Tragedy; its Original Excellency and Corruption: with some Reflections on Shakespear and other practitioners for the Stage.' This is the work in which he attacks some of Shakspere's tragedies in a manner ludicrously absurd. In 1694 appeared his translation of Mons. Rapin's 'Reflections on Aristotle's Treatise of Poesie.' There are other minor tracts by him, among which is probably to be reckoned the 'Life of Thomas Hobbes,' printed 'apud Eleutherium Anglicum sub signo Veritatis, 1681.'

On December 23, 1692, he was made historiographer royal, a post which had been held by Shadwell and Dryden. The salary was 200*l.* per annum. There was at that time a scheme for publishing a corpus of the documents which remain connected with the transactions between England and other states. It was intended that it should be a large and comprehensive work, honourable to the English nation, and useful to the historical inquirers, not only of England but of all other countries. The patrons of this magnificent design were Montagu, who was afterwards earl of Halifax, and Lord Somers. The execution of it was committed to Rymer. His duties were twofold: first, to collect the instruments themselves, which were to be found chiefly in the chronicles and in the depositaries of public records, particularly the Tower of London and the Chapter-House at Westminster; secondly, to print accurate copies of them. The first volume appeared in 1703, and it was followed by others in quick succession, the later volumes being carried through the press by Sanderson, who had assisted Rymer almost from the beginning.

The work did not disappoint the expectations of the public. It entirely changed the face of the histories of our own country, as may be seen by Rapin's History, and it was hailed with great satisfaction by all the historical writers o. Europe.

Large as the work was, there have been three editions of it. A fourth was undertaken by the Commissioners on the Public Records, in which it was proposed to incorporate other documents, which had been discovered since the time of Rymer. This edition extends only to the close of the reign of Edward III.

There are in the British Museum a great number of transcripts of documents made under Rymer's direction not used in his work.

Notwithstanding his appointment of historiographer, and whatever remuneration he might receive for his labours on the 'Fœdera,' Rymer became exceedingly poor in the latter part of his life, and died December 14, 1714, in Arundel Street, in the Strand, and was buried in the church of St. Clement Danes.

RYNCHÆA. [SCOLOPACIDÆ.]

RYNCHOPS, the name assigned by Linnæus to a genus of aquatic palmipede birds. The word would be more correctly written *Rhynchops* (ῥύγχος), and indeed is so spelled by most ornithologists; but the word stands in the last edition of the *Systema Naturæ*, published by Linnæus, as it appears at the head of this article, and the genus is arranged at the end of the *Anseres*, coming immediately after *Sterna*, which last is preceded by *Larus*.

Latham placed the form among the *Palmipedes* with short feet; and Lacépède, in the first subdivision of the first division of his second subclass, which last consists of those birds which have the lower parts of the leg denuded of feathers, or many toes united by a wide membrane. *Rynchops* appears in his twenty-fourth order, containing the web-footed birds which have the bill straight and compressed, immediately before the *Divers* (*Urinator, Colymbus*, &c.).

M. Duméril arranged it among his family *Longipennes*, or *Macroptères*, in the order *Palmipedes*. Illiger also places it among his *Longipennes* (in company with *Sterna* and *Larus*), in his order *Natatores*.

Cuvier places it also among the *Longipennes* (order *Palmipedes*), immediately after the Terns and Noddies.

M. Vieillot gives it a position among the fourth family (*Pelagians*) of his first tribe (*Teleopodes*) of his order *Natatores*.

In M. Temminck's method it appears in the order *Palmipedes*, near the Terns and Gulls.

Mr. Vigors observes that *Phaëton* [TROPIC BIRD], which belongs to the *Pelecanidæ*, bears a considerable resemblance in general appearance and habits to the *Sterna* of Linnæus; and he enters the family of *Laridæ* by means of the last-mentioned genus, with which, he remarks, *Rynchops* most intimately accords in habits and external characters, notwithstanding the dissimilitude of the bill.

M. Latreille places the genus next to the Terns and Noddies, at the end of the *Longipennes*, the third family of his *Palmipedes*.

The Prince of Canino arranges the form at the head of his family *Longipennes*, in the order *Anseres*, immediately before *Sterna* (*Specchio Comparativo*). In the *Birds of Europe and North America* he makes *Rhyncopsinæ* the first subfamily of the *Laridæ*, and places it immediately preceding the *Sterninæ*. One genus only (*Rhyncops*) belongs to the *Rhyncopsinæ*.

Mr. Swainson (*Classification of Birds*) makes *Rynchops* a subgenus of *Sterna*, which last he places at the head of the family *Laridæ*, and he arranges *Rynchops* between the subgenera *Phaëton* and *Gavia*.

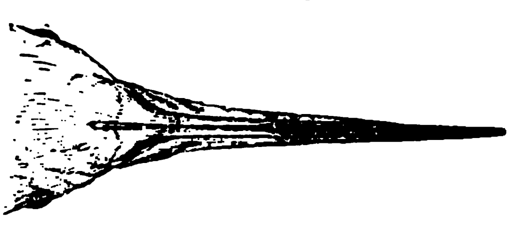
Mr. G. R. Gray (*List of the Genera of Birds*) arranges *Rhyncopsinæ*, with its single genus *Rhyncops*, as the third subfamily of the *Laridæ*, placing it between the subfamilies *Larinæ* and *Sterninæ*.

Generic Character.—*Bill* longer than the head, straight or nearly so, compressed, and in form resembling the blade of a knife, truncated, and with the appearance of having been broken at the point; upper mandible much shorter than the lower, and with a groove into which the lower mandible is received; nostrils marginal, median. *Feet* moderately long, slender. *Wings* very long; the first quills longest.

The extraordinary structure of the bill in this bird immediately fixes the attention. In appearance it looks, at first sight, like a worn or imperfect organ: in reality it is an instrument of the nicest adjustment as applicable to the purposes which it has to execute. Buffon, as was too frequently his wont, condemns an organization which he did not understand and indeed could never have accurately examined. 'The bird named *Bec-en-ciseaux* (Scissor-bill),' says this eloquent but hasty writer, 'can neither bite on the side of the bill nor pick up anything before it, nor peck forwards, its bill being composed of two excessively unequal pieces; the lower mandible, which is elongated and projecting (avancée) beyond all proportion, much exceeds the upper mandible, which only falls upon it like a razor on its haft. In order to reach anything and seize it with so defective an organ, the bird is reduced to skim the surface of the sea as it flies, and to plough it with the lower part of the bill plunged in the water so as to catch the fish below and lift it as the bird passes. It is from this *manège*, or rather from this necessary and painful (pénible) exercise, the only one which could enable it to live, that the bird has received the name of *Coupeur d'eau* (cut-water) from some observers, whilst the name of *Scissor-bill* has been intended to point out the manner in which the two unequal mandibles of its bill fall one upon the other; of these, the lower, hollowed into a gutter with two elevated trenchant edges, receives the upper, which is fashioned like a blade (lame).' Buffon then quotes Ray in proof of this supposed structure: 'Maxilla superior inferiore multò brevior, et in illam, ut novacula in manubrium suum, incidit.'

Now the structure is the very reverse. The upper mandible at its base overlaps the lower with its edges; but the upper edge of the under mandible, which consists of a thin flattened plate or blade, is received in a groove with elevated sharp edges, on the lower surface of the upper mandible: this groove diverges at the base, and thus comes to overlap the lower at the gape as above noticed. We shall presently see how effectually this apparently uncouth instrument is adapted to the necessities of the animal. Catesby indeed justly speaks of it as 'a wonderful work of nature,' and accurately describes it. 'The under mandible,' says he, 'is more compressed than the upper, and very thin, both edges being as sharp as a knife, and is almost an inch longer than the upper mandible, which has a narrow groove or channel into which the upper edge of the lower mandible shuts.' Yet Buffon, who quotes Catesby, gives the erroneous description above noticed.

Bill of Rynchops.



Bill of Rynchops, the mandibles closed, and seen from below.

Example, *Rynchops nigra*.

Description.—*Male.*—About 19 inches in len closed wings extend beyond the tail four inches stretch 44 inches. Length of the lower mandible 4½ inc of the upper 3½; both red, tinged with orange, and with black. Upper part of the head, neck, back, scapulars black; wings the same, except the seconda which are white on their inner vanes, and also tipped white. Tail forked, the two middle feathers about inch and a half shorter than the exterior ones, all broadly edged on either side with white: tail-coverts on the outer sides, black in the middle. Front, ch and neck below the eye, throat, breast, and all the parts white. Legs and webbed feet red-lead colour.

Female only 16 inches long, and 39 in alar stretch: lar with the male in plumage, except in the tail, white-shafted and broadly centred with black.*

There are oblique striæ on the lower mandible, wh come most apparent in the dead and dry specimen.

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* The description is almost entirely Nuttall's.

Tl is the *Bec-en-ciseaux* and *Coupeur d'eau* of the : *Sheerwater*, *Cut-water*, *Skimmer*, and *Black* of the Anglo-Americans; and *Piscator* of the lian.

Locality.—Tropical and temperate America.

Habits, Food, Nidification, &c.—Linnæus thus succinctly and truly describes its habits: 'Volando aquæ superficiem , ex illa insecta* pisciculosque, mandibulo inferiore in- ucta, extrahit; victitat etiam conchiliis.' Catesby says, se birds frequent near the sea-coasts of Carolina. y fly close to the surface of the water, from which they to receive somewhat of food. They also frequent r-banks, on which I believe they feed; the structure of bills seems adapted for that purpose.'

lson thus describes their mode of taking food on the ng: 'The *Sheerwater* is formed for skimming, while on the surface of the sea for its food, which consists h, shrimps, young fry, &c., whose natural haunts near the shore and towards the surface. That the lower ndible, when dipped into and cleaving the water, might retard the bird's way, it is thinned and sharpened like blade of a knife; the upper mandible, being at such s elevated above the water, is curtailed in its length, as less necessary, but tapering gradually to a point, that utting it may suffer no opposition. To prevent incon- e from the rushing of the water, the mouth is con- the mere opening of the gullet, which indeed pre- ts mastication taking place there; but the stomach or ard, to which this business is solely allotted, is of un- n hardness, strength, and muscularity, far surpass- hese respects any other water-bird with which I am ainted. To all these is added a vast expansion of wing, ble the bird to sail with sufficient celerity while dip- n the water. The general proportion of the wing of wiftest hawks and swallows to their breadth is as one to ; but in the present case, as there is not only the resist- nce of the air, but also that of the water to overcome, a l greater volume of wing is given, the sheerwater mea- teen inches in length, and upwards of forty-four In short, whoever has attentively examined this pparatus, and observed the possessor, with his ample ong bending neck, and lower mandible occasionally into and ploughing the surface, and the facility with h he procures his food, cannot but consider it a mere yful amusement, when compared with the dashing immersions of the tern, the gull, or the fish-hawk, who to the superficial observer appear so superiorly accommodated. The sheerwater is most frequently seen skimming close along shore, about the first of the flood. I have observed eight or ten in company passing and repassing at high water, dipping with extended neck their open bills into the water with as much apparent ease as swallows glean up flies.'

And this is the 'exercise pénible' of M. Buffon, to which he tells us the bird is condemned on account of its 'organe defectueux.'

Mr. Darwin says, 'I saw this bird both on the east and west coast of South America, between latitudes 30° and 45°. It frequents either fresh or salt water. Near Maldonado, in May, on the borders of a lake which had been nearly drained, and which in consequence swarmed with small fry, I watched many of these birds flying backwards and forwards for hours together close to its surface. They kept their wide open, and with the lower mandible half buried in water. Thus skimming the surface, generally in small ks, they ploughed it in their course; the water was quite oth, and it afforded a curious spectacle to behold a flock, bird leaving its narrow wake on the mirror like sur- In their flight they often twisted about with extreme ity, and so dexterously managed, that they ploughed up ll fish with their projecting lower mandibles, and ured them with the upper half of their scissor-like bills. fact I repeatedly witnessed, as like swallows they con- d to fly backwards and forwards close before me. Oc- ally when leaving the surface of the water, their flight wild, irregular, and rapid; they then also uttered loud h cries. When these birds were seen fishing, it was ous that the length of their primary feathers was quite essary in order to keep their wings dry. When thus loyed their forms resembled the symbol by which many sts represent marine birds. The tail is much used in ring their irregular course.

These birds are common far inland, along the course of the Rio Parana; and it is said they remain there during the whole year, and that they breed in the marshes. During the day they rest in flocks on the grassy plains, at some distance from the water. Being at anchor in a small vessel in one of the deep creeks between the islands in the Parana, as the evening drew to a close one of these scissor-beaks suddenly appeared. The water was quite still, and many little fish were rising. The bird continued for a long time to skim the surface; flying in its wild and irregular manner up and down the narrow canal, now dark with the growing night and the shadows of the overhanging trees. At Monte Video, I observed that large flocks remained during the day on the mud-banks at the head of the harbour, in the same manner as those which I observed on the grassy plains near the Parana. Every evening they took flight in a straight line seaward. From these facts I suspect that the Rhynchops frequently fishes by night, at which time many of the lower animals come more abundantly to the surface than during the day. I was led by these facts to speculate on the possibility of the bill of the Rhynchops, which is so pliable, being a delicate organ of touch. But Mr. Owen, who was kind enough to examine the head of one which I brought home in spirits, writes to me (August 7, 1837) that 'the result of the dissection of the *Rhynchops*, comparatively with that of the head of the duck, is not what you anticipated. The facial or sensitive branches of the fifth pair of nerves are very small; the third division in particular is filamentary, and I have not been able to trace it beyond the soft integuments at the angles of the mouth. After removing with care the thin horny covering of the beak, I cannot perceive any trace of those nervous expansions which are so remarkable in the lamellirostral aquatic birds, and which in them supply the tooth-like process and soft marginal covering of the mandibles. Nevertheless, when we remember how sensitive a hair is through the nerve situated at its base, though without any in its substance, it would not be safe to deny altogether a sensitive faculty in the beak of the Rhynchops.' (*Zoology of the Voyage of H. M. S. Beagle.*)

But it appears that this organ is not merely useful as a skimmer, but that it is equally available as an oyster-knife. M. Lesson says:—'Though the *Bec-en-ciseaux* seems not favoured in the form of the beak, we had proof that it knew how to use it with advantage and with the greatest address. The sandy beaches of Penco are in fact filled with *Mactræ*, bivalve shells, which the ebbing tide leaves nearly dry in small pools; the *Bec-en-ciseaux*, well aware of this phenomenon, places itself near those mollusks, waits till their valves are opened a little, and profits immediately by the occasion to plunge the lower and trenchant blade of its bill between the valves, which immediately close. The bird then lifts the shell, beats it on the beach, and cuts the ligament of the mollusk, which it then swallows without obstacle. Many times have we been witnesses of this highly perfected instinct.' (*Manuel d'Ornithologie.*)

Mr. Darwin seems to think this use of the bill very improbable; but he gives no reason that ought to weigh against the direct testimony of so good an observer as M. Lesson, for whose accuracy in many cases we can vouch. Indeed, though Mr. Darwin quotes Wilson as declaring that he does not believe the report of its frequenting oyster-beds and feeding on those fish, he acknowledges the existence of this report in the United States, and seems neither to be aware of the passage in Catesby above quoted, nor of the 'victitat conchiliis' of Linnæus.

But, if we are to reason upon this use of the bill, Mr. Owen's account of the absence of nerves from its anterior portion comes in aid of M. Lesson's evidence. The insensibility of the blade of the lower mandible would be a necessary condition for its undergoing the pressure of a bivalve shell griping it with the whole force of the adductor muscles. No lamellirostral bird could support the pain of such a situation; and if one of the ducks should by any chance get the end of its highly sensitive bill into such a vice, it would not be very ready to repeat the experiment.

M. Lesson further states that the bird flies slowly, and at great distances from the coasts of Concepçion (Chili); and that, with the gulls and other sea birds, it formed bands so thick ('et quod vidimus testamur'), that they resembled long moveable black scarfs, which obscured the heavens from the banks of the Penco to the isle of Quiriquine, a space of twelve miles (*Manuel d'Ornithologie.*)

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* Crustaceans were classed by Linnæus among the *Insecta*.

Mr. Nuttall states that the Cut-water, or Black Skimmer, is a bird of passage in the United States, appearing in New Jersey (to the north of the sea-coast of which he believes it is unknown) from its tropical quarters early in May; and he thinks that it probably passes the breeding season along the whole of the southern coast of the United States. In New Jersey it 'resides and breeds in its favourite haunts, along the low sand-bars and dry flats of the strand in the immediate vicinity of the ocean. Their nests have been found along the shores of Cape May about the beginning of June, and consist of a mere hollow scratched out in the sand, without the addition of any extraneous materials. The eggs are usually three in number, oval, about one inch and three quarters to two inches by one inch and a quarter, and nearly pure white, marked almost all over with large umber-brown blotches and dashes of two shades, and other faint ones appearing beneath the surface. In some eggs these particular blotches are from half an inch to an inch in length. As the birds, like the terns and gulls, to which they are allied, remain gregarious through the breeding season, it is possible to collect half a bushel or more of the eggs from a single sand-bar, within the compass of half an acre; and though not very palatable, they are still eaten by the inhabitants of the coast. The female only sits on her nest during the night, or in wet and stormy weather; but the young remain for several weeks before they acquire the full use of their wings, and are during that period assiduously fed by both parents: at first they are scarcely distinguishable from the sand by the similarity of their colour, and during this period may often be seen basking in the sun, and spreading out their wings upon the warm beach. The pair, retiring to the south in September, or as soon as their young are prepared for their voyage, raise but a single brood in the season.' (*Manual of the Ornithology of the United States and of Canada*, vol. ii.)

The same author states that this species is met with in the equatorial regions of America, where it is resident as far as Surinam, but never penetrates into the interior, being, properly speaking, an oceanic genus.

Rynchops nigra.

M. Lesson remarks that, though this bird closely approaches the species belonging to the Antilles, it is still possible that it may be distinct from it.

RYOTS, the name by which the cultivators of the soil in Hindustan are designated. The social and economical condition of the ryots presents several peculiar features, which form an interesting subject of inquiry for the political economist.

The ryots pay rent out of the produce of their land to a sovereign proprietor, and, so long as they pay the rent demanded of them, have a claim to the continued occupation of the land. This indeed is the condition of the cultivators of land, not only in Hindustan, but in all Asiatic countries. In speaking then of ryots, we speak of the cultivators of land throughout Asia.

The economical condition of the Asiatic cultivator may be described as being made up of the three following circumstances:—1. He is an hereditary occupier, or, in other words, has an hereditary claim to the occupation of the land which he cultivates. 2. The amount of rent which he pays is, in practice, determined by the sovereign power. 3. There exists a number of classes intermediate between the hereditary occupier and the sovereign, all entitled various portions of the revenue which is yielded by the la but none having any proprietary right. The er these intermediate classes, arising out of the tendency offices connected with the land to become hereditary. contributed greatly to the ignorance prevalent Europeans of the position of Asiatic cultivators.

Such being the general features of the economical condition of the ryot, his actual position necessarily depends most on the amount of rent paid by him to the sovereign, and the manner in which the rent is paid.

The amount of rent was fixed by the laws of Menu at a sixth, an eighth, or a twelfth of the crops, according to differences in the soil, in the degree of labour necessary to cultivate it, and in the general prosperity of districts; but in times of urgent necessity, of war or invasion, the same laws allowed the king to take even so much as a fourth. (*Institutes of Menu*, c. iii., 130; x. 118, 120.) A sixth part of the produce had come to be the uniform tax in Hindustan, when the Mohammedans become its masters. (*Sacontala*.) But we find in Strabo, that when Alexander invaded India, a fourth of the produce was generally taken as rent. The despotic sovereigns of the East did not long continue to observe their antient laws, sometimes openly violating them, at other times evading them by a resort to indirect taxation. Indeed before the Mohammedan period there are instances of oppression by Hindu governments, under which the ryots were allowed to retain no more than a fifth or sixth of their crops.

The form in which the rent is paid has even a gr fluence on the condition of the ryot than its antient times the rent was always paid in produce. ever, in later times, it has been demanded in mo effects have been ruinous to the ryot, chiefly owing want of markets. When the ryot is compelled to money, which, owing to the want of a ready mar a difficulty in doing, his obvious resort is to a money- The money which he borrows for the purpose of re himself of immediate difficulty is borrowed at a h interest. The immediate difficulty is thus got great sacrifice, and the ryot becomes dependent money-lender. In villages where money-payment is ad the money-lender is generally the party contracting the government for the rents (the *Maharjum*): and he suddenly to leave the village, taking with h the village would be ruined.

The agency by means of which the rents are coll though less important than the form of payment, considerable influence on the condition of the ryot. account of the system of agency through which the an Indian governments collected their rents from the ry of the modifications which this system has undergone the British sway, will here be interesting.

Under the antient Indian governments, the agents of the prince to whom districts were assigned transacted immediately with the ryots, either singly or in villages. The latter mode was the more general, by which the government levied a certain sum on each village, and left it to the vill to settle the individual quotas among themselves. The villages were so many little republics or corporations, governed in the following manner:—There was a head of the vill (*Potail*), originally elective, but afterwards hereditary, united in his own person the magistracy, the supe dence of the police, and the duties of collecting the reve a registrar (*Curnum*), who kept the accounts of cult sales, transfers, rents, contracts, receipts, and dis ments; and a number of other officers, comprehe Brahmins for the service of the gods as well as handicraftsmen, inferior ministers of police, complement of these officers was twenty-four. lages did not contain this number. As were made to all these officers, which Fees paid by the ryots furnished additional profits.

As regards the payment of rents, there were two arrangement prevailing in the villages. In so the land was cultivated in common, and each had a share of the produce assigned, accord fixed rules; these were called *byacharry* villages. In others each ryot cultivated separately spot of land, and paid rent for it separately: these the name of *putterday* (partnership) villages.

The heads of villages paid the rents collected to the h of districts (*des adikars*); these again to the heads acts of country. The system of government in the *Institutes of Menu* enumerates lords wn or district, of ten towns, of twenty towns, of a towns, and a thousand towns. All these lords assignments of land, and a per centage on their s besides.

ads of districts (des adikars) came afterwards to sented by one class of Zemindars, namely those ties were confined to the superintendence of The class of Zemindars however which is the best that class in which the duty of collecting the reve- dded to the superintendence of police. This is not to speak of these functionaries, or to trace the in their duties and position until the commence- the British dominion. [ZEMINDAR.] Under the d must be placed an account of the first proceed- e English with the Zemindars, and the influence proceedings on the Ryots. [CORNWALLIS, LORD; AN.]

and interesting account of Ryot rents will be found nes's *Essay on the Distribution of Wealth, and urces of Taxation*, pp. 109-142. The reader is lso to Mr. Mill's *History of India*, vol. i., p. 271-3.

RAECK or RYSBRECHTS, PETER, an artist, born at Antwerp, in 1657, and studied under ilé, whom he accompanied to Paris. He followed of Poussin, in imitating whom he was pre-emi- ccessful. Notwithstanding large offers and flat- couragement to remain in France, he returned to city, and in 1713 was made director of the Aca- re. The landscapes of Rysbraeck are distinguished ur of style, which, though founded on an imitation mirable productions of Nicholas Poussin, possess originality to secure him from the imputation of . Indeed he painted in the spirit rather than works of that great artist. Rysbraeck's colour- monious, his touch is bold and free, and he pos- eat facility of execution. Still there is a want of certain monotony in his pictures, which places he estimation of connoisseurs, far below those of (Pilkington's and Bryan's *Dictionaries*.)

ICK, PEACE OF, was concluded in 1697, and d the war which had been begun in 1688 by ainst Holland, England, Germany, and Spain, s to the league of Augsburg (1686) and the Grand (1689). Four treaties were upon this occasion the royal palace of Ryswick: the first, between d Holland, on the 20th of September; the second, rance and Spain, on the same day; the third, France and England, on the 21st; the fourth, rance and Germany, on the 30th of October. By with the United Provinces, which was founded upon the treaties of Westphalia (1648) and of Nimeguen (1678), Louis XIV. agreed to restore all his conquests from that power, and the Dutch in like manner gave back to France their conquest of Pondicherry in the East Indies. A separate treaty of commerce between these two powers was also signed at the same time, the provisions of which it is unnecessary to detail. By the treaty with Spain, Louis restored Gerona, Rosas, and his other conquests in Catalonia, and also Luxembourg, Charleroi, Mons, and all the other places in the Low Countries of which reunions had been made by France since the peace of Nimeguen. A list of these reunions was appended to the treaty. By the treaty with England, all conquests during the war were mutually restored; and Louis acknowledged William III. as lawful king of Great Britain, and engaged not to furnish any succours to the deposed king James II. By the treaty with the emperor, Louis restored Fribourg, Philipsburg, and Brisac, undertook to demolish the fortifications of Huningen, and consented to the re-establishment of the duke of Lorraine; and the emperor ceded to France Strasburg and its dependencies, which were already in the actual possession of that power. The general peace that followed the treaties of Ryswick lasted till 1702.

Ryswik, or Ryswick, is a village in Holland, a league from the Hague, with about 2000 inhabitants, and the port of Nieuwburs. [PARTITION TREATIES.]

RY'TINA. [WHALES.]

RZESZOW is a circle in Austrian Galicia, containing about 1700 square miles and 231,000 inhabitants. It is situated along part of the southern frontier of the kingdom of Poland. The country is level and fertile: it produces corn and flax. A considerable part of it, especially in the north between the rivers San and Vistula, is covered with forests. There are no manufactures except linen, woollen cloth, leather, and wooden wares.

RZESZOW, the chief town, has nearly 5000 inhabitants, of whom rather more than half are Jews. Among the latter are many goldsmiths, or rather manufacturers of all kinds of trinkets composed of base metal with a very small mixture of gold, and known by the name of Rzeszow gold. The inhabitants have some linen and cloth manufactures, and carry on a good trade in corn, furs, &c. This town is considered to be one of the best built in Austrian Poland. There is a gymnasium, a district school for boys and girls, an hospital, and other useful institutions.

The other three towns are, Lezaisk, 3288 inhabitants; Przeworsk, 3000 inhabitants (a wretched place, consisting almost entirely of wooden houses); Lanzut, with only 2000 inhabitants, but remarkable for a fine palace of Prince Lubomirski, with beautiful gardens, and an avenue of lime-trees two leagues in length.

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S.

ef sibilant of the English alphabet, and is em-
present two different sounds, as in *this* and *these*.
gar would seem to justify the addition of a
sh; but in this word the vowel *u*, so often pro-
has modified the pronunciation of the preced-
nt. *Syugar* would easily glide into *shugar*.
brew alphabet, whence those of Europe are
mmon symbol is employed, with and without an
o denote *s* and *sh*. The symbol referred to has
a word which also signifies *tooth* or *teeth*; and
mind that the so-called Phœnician and Sama-
ets give older forms of the Hebrew letters than
ed, it will be easily believed that the symbol in
ape [ALPHABET, p. 382] was the representation
e teeth; an origin which would agree with the
sibilants are all formed by means of the upper
he sound *sh* by the upper and lower brought
his explanation is confirmed by the considera-
emitting the last-named sound the teeth are
sole organs employed, but more than usually
iew by the retraction of the lips. But for the
nce thus furnished by the Hebrew alphabet, the
ower of the letter might have been readily
an imitation of a hissing snake.

s is subject to the following interchanges, many
e been previously noted.

. See D.

h and *sth*, as in the Laconian dialect of the
age in which θεος, Τιμοθεος, Αθηναια, take the
ιμοσεορ, Ασαναια. Hence too τυπτομεσθα, &c.
d into τυπτομεθα, &c. The English language
te *loveth*, *hateth*, but now prefers *loves*, *hates*.

. Thus again the Attic forms φησι, επεσον,
were by the Dorians written φατι, επετον (regu-
from the present πιπ(ε)τω), Ποσειδαν, τυ. In
the German words *das*, *was*, *es*, *wasser*, *hassen*,
in English as *that*, *what*, *it*, *water*, *hate*, *eat*.

z. Thus the Greek island Ζακυνθος was the
of Saguntum in Spain, and no doubt gave its
In fact, the MSS. of Livy (xxi. 7), with one
rcely worth mentioning, appear to have all got
agunto insula dicuntur, not *Zacyntho*. But
ndant evidence of the interchange is to be
Somersetshire dialect of our own tongue.

h. Witness the Berlin pronunciation of all
ls beginning with *st*. Moreover, the English
slay, *smear*, *snow*, have for their German equi-
f, *schlag-en*, *schmier-en*, *schnee*.

g, and *h*. See those letters.

g. See X.

. See N.

. See R.

appears before an initial consonant, where it is
ther the older form be that with or that without
Thus the Greek στεγω, σφενδονη, σφηξ, cor-
he Latin *tego*, *funda*, *vespa*. So σκελος and
be found upon close examination to be the
f the Latin *crus* and *crux*, and σκαλευω to differ
ri only in the fact that the latter is a frequent-
Again the Greek possesses within itself the
σμικρος and μικρος, στρεφω and τρεπω. The
uage contains numerous examples of the same
in *melt* and *smelt*, *tumble* and *stumble*, *pike* and
German as well as our own tongue not unfre-
xes an *s* when the Greek and often the Latin
hat letter. Thus the Greek κλει-ω (root κλεις
Latin *claud-o* or *clud-o*, and *clavis*, the German
nd the English *shut* are all of one kin. Com-
various forms of the words signifying *snow*.

ound *sw* at the beginning of words is often de-
e loss of the sibilant or *w*, or both. Thus to the
and *suadeo* correspond the Greek ἀδυς, &c., the
, and the English *sweet*. Those who doubt the
ere assumed between *suavis* and *suadeo*. may,
rm, compare *clavis* and *claudo*, or *viginti* with
ve been its older form, *duiginti*, while the con-
ing will be readily established by the common comparison of *advice* with *medicine*, *unpalatable* but *salutary*, as in Lucretius, (i. 935), *Sed veluti pueris absinthia*, &c. Again *sop-or* and *somnus* (*sop-nus*) of the Latin correspond to the Greek ὑπ-νος, to the Gothic verb *in-suepp-an*, the German *schlaf*, and the English *sleep*; *socer* and *socrus* in Latin, to the Greek ἑκυρος and ἑκυρα, and the German *schwieger* as prefixed to *sohn*, *vater*, &c.; the Latin *sud-or*, to the Greek ιδ-ος, ἱδρως, &c., to the German *schweiss* and English *sweat*; the Latin *sui*, *sibi*, *se*, to the Greek οὑ, οἱ, ἑ, although the Greek has also allied words beginning with σφ. The Latin *soror*, German *schwester*, English *sister*, have lost their correlative in Greek. Lastly this interchange will perhaps account for the fact that the river Oder has two antient names, *Suevus* and *Viadrus*, which have been the cause of much confusion in the geography of antient Germany. Indeed the mouth of the river is still called *Swinemünde*.

11. *Sp* is interchangeable with *ps*, *sk* with *ks*, and *sd* with *ds*. For the last we need only refer to the Doric use of σδ for ζ. Instances of the second interchange occur occasionally in Greek and Latin. Fιξος, the misletoe, is written in Latin *viscus*; εσχατος, ludicrously put down as a primitive in some lexicons, is of course only the superlative of the preposition εξ, for εξατος. The Latin *misceo* has for its participle *mixtus* as well as *mistus* (= *misctus*). The tendency to this interchange accounts too for the form *sescenti*, for *sexcenti* is never found in the best MSS. of the best authors. But the Anglo-Saxon and English afford the most numerous instances of this metathesis. Thus the former language has the double forms *väps* or *väsp*, a wasp; *äpse* or *äspe*, tremulous (whence the name of the *aspen* tree); *häpse* or *häspe*, a lock (Grimm, *Deutsche Grammatik*; p. 251); also *frosc* or *frox*, a frog; *fiscas* or *fixas*, a fish; *tusc* or *tux*, a tusk: *asce* or *axe*, cinder; *ascjan* or *axjan*, to ask (*ibid.*, p. 256). Hence it will be seen that it is a mere accident if in our own tongue *axe* and *waps* have been rejected as vulgarisms in favour of *ask* and *wasp*. The provinces still prefer the *ks* and *ps*. Thus a Kentish countryman talks of a *whips* rather than *whisp* of hay. May we not in this way establish the identity in name of several of our rivers, as *Axe*, *Exe*, *Esk*, and *Usk*?

12. *S* is often lost. Inattention to this fact is the cause of much confusion in the grammars of the Greek language. Thus the neuter nouns in ος must once have had a corresponding σ in the genitive, γενες, γενεσος, &c., afterwards γενος, γενεος. Hence the retention of the ς in the vocatives of proper names formed from neuter nouns of this class, as Διογενες, Δημοσθενες, Σωκρατες. (See *Journal of Education*, vol. iv., 333.) Above all, the neglect of this letter in the original (as here assumed) forms of certain present tenses leads to apparent anomalies in the derived forms. Thus from κλει(σ)ω we should have without any irregularity κεκλεισμενος; from γευ(σ)μαι without difficulty γευσ-τικος, as well as the Latin *gus-tus*, *gus-ta-re*; from δε(σ)ω, δεσμος, in which the sibilant corresponds, as it so often does, to the guttural in *liga-re*, *dica-re*, and the English *tight* from *tie*. The Latin language in such cases changes the sibilant into an *r*; but even this language is not at all unwilling to discard an *s*, particularly at the end of words, as in the double forms *magis* and *mage*, *videris* and *videre*, *ipsus* and *ipse*, *puer* for *puerus*. Nay, even the neuters of adjectives seem to have lost the final *s* of the nominative in this way. At any rate *potis* is used for a neuter nominative as well as *pote*. The third person of the Latin perfect may possibly owe its occasional long quantity (*perrupīt*, Hor.; *subīit*, Hor.; *redīit*, Ovid, &c., &c.) to an older orthography ending in *ist*; for as the other perfects of the indicative as well as those of the subjunctive and infinitive of the active verb, to say nothing of all the passive perfects, are evidently formed by the addition of the tenses of the verb *esse*, so *perrupistis* and *perruperunt* contain in the two last syllables the almost unaltered forms of *estis* and *erunt*, and seem to justify the idea that *perrupit* is a corruption of *perrupist*, i.e. *perrupest*. As to form, we might compare this corruption with what we know has occurred in the French subjunctive perfect, *fusse*, *fusses*, *fût*, that is, *fust*. The French language abounds in examples of the loss of the sibilant. Thus from the Latin *asinus*, *magister*, *noster*,

quadragesima, are derived, first, *asne*, *maistre*, *nostre*, *caresme*, and then, according to the modern orthography, *âne*, *maître*, *notre*, *carême*, to say nothing of the silent *s* in such words as *mais*, *vous*, *isle*, *est*, &c.

SA DE MIRANDA. [MIRANDA.]

SAAD-ED-DEEN (*Khoja Saad-ed-deen Mohammed Effendi*), the most celebrated of the Turkish historiographers, was born in the early part of the sixteenth century of our æra; his father, Hassan-Jan, a Persian by birth, held a post in the household of Sultan Selim I., and was highly esteemed by that ferocious monarch, whom he attended in his last moments. His son Mohammed received his education among the pages of the imperial palace, and having devoted himself to the study of Moslem theology and jurisprudence, became a muderris, or professor in the college attached to the great mosque of St. Sophia. The talents and learning which he displayed in this capacity gave him high celebrity; and he was appointed by Selim II., in 1573, khoja, or preceptor to his son Mourad, the heir apparent, who then held the government of Magnesia. The death of Selim, in December, 1574, called Mourad to the throne; and Saad-ed-deen was nominated cadhilesker, or military judge; but he continued to retain almost unlimited influence over his imperial pupil, who had recourse to his advice in matters of government so constantly as to excite the jealousy of the vizirs; and an attempt was made to ruin him by representing the erection of an astronomical observatory, which the sultan had founded at his instigation near Top-khana, as an evil omen for the stability of the empire. But though the observatory was demolished by the superstitious fears of Mourad, the favour with which he regarded Saad-ed-deen was unimpaired; and Mohammed III., who succeeded in 1595, continued to entrust the confidential adviser of his father with the management of the most secret diplomatic relations of the empire; the Khoja-Effendi (as Saad-ed-deen is frequently termed by Oriental writers) even attended Mohammed in the Hungarian campaign of 1596; and the great victory of Kereszteѕ is ascribed in a great measure to his exhortations, which prevented the sultan from abandoning the field at the moment of extreme peril. He however incurred a temporary disgrace immediately afterwards, by his advocacy of the cause of the fallen vizir Cicala; but he was speedily restored to favour, and on the death of the mufti Bostan-Zadah, March, 1598, was raised to the highest ecclesiastical dignity by the sultan, in spite of the opposition of the grand-vizir Hassan, who proposed the elevation of the celebrated poet Baki. He did not however long survive his exaltation, dying suddenly in the mosque of St. Sophia, as he was preparing for prayers on the anniversary of the birth-day of the prophet, October 2, 1599 (not 1600, as stated in the *Biogr. Univ.*), A.H. 1008, and was interred in the cemetery of the mosque of Ayub, whither his remains were borne by his four sons, two of whom at subsequent periods also held the dignity of mufti. The great historical work of Saad-ed-deen, composed by order of Mourad III. (who created for the author the new office of shahnamehdji, or imperial historiographer), is entitled Tadj-al-Towarikh, or the crown of histories, and gives a full and copious narrative of the history of the empire, from its foundation in 1299 by Othman, to the death of Selim I. in 1520; the materials are principally drawn from the previous works of Neshri, Moulana-Edris, and Kemal-pasha-Zadah; but its chief merit, in the estimation of the Turks, consists in the florid and elaborate beauty of the diction, in which the author is certainly unrivalled by all other Turkish historians. Sir W. Jones has pronounced that 'for the beauty of its composition and the richness of its matter, it may be compared with the finest historical pieces in the languages of Europe;' but the meaning is too often concealed by a cloud of rhetorical tropes, and it is impossible to forget in the perusal of the work that it is the production of a courtier. It is singular that this valuable work has never yet been printed at the imperial press of Constantinople; but MS. copies are frequent in European libraries, and an Italian version was published by the Ragusan Vincenzo Bratutti (4to., part i., Vienna, 1646; part ii., Madrid, 1652), under the title 'Cronaca dell' Origine e Progressi degli Ottomani, composta da Saidino Turco, e tradotta in Italiano;' small portions have also been translated by Kollar, and by Grangenet de la Grange. A Turkish abridgement of the work, with a continuation, was published in 1696 (A.H. 1108), with a dedication to Sultan Mustapha II., by Saadi-Effendi of Larissa; and the resemblance of name has often led to this work (which served as the b
accurate compilation of Cantemir) being co
the great history of Saad-ed-deen. (See Von
Journal Asiatique, January, 1824.) Besides this
Saad-ed-deen was the author of the 'Selim-N
history of Selim I., or rather a collection of
that prince, related to him by his father Hassan-
compilation, which is divided into fourteen
valuable for its authenticity. His descendants
have flourished for several generations, and
herited the talents of their ancestor; two of his
already noticed, Mohammed-Effendi and Assad
attained the rank of mufti; and a grandson or
son of the latter, Mollah-Fayez, is mentioned as
legist by Sheikhi, who notices his death in 1724.

(Von Hammer, *Histoire de l'Empire Ottoman*;
belot; *Biographie Universelle*; *Journal Asiatiq*

SAADI, or (as his name is written in full in
Persian) *Sheikh Moslih Eddin Saadi Alshirazi*,
part of the name being a title of honour, the two
his epithet, and the last expressive of his
of the city of Shiraz, where he was born in the
Hegira 571 (A.D. 1175-6). He is probably better
name to the European reader than any other poet of
the East, excepting Mohammed; and while this
putation may be in some measure attributed to
amongst his own countrymen, a circumstance wh
naturally recommend his work for perusal and
the few Persian students of two hundred years
also in a great degree ascribed to the simpl and
of his style, so like that of the best peri
ture, and so unlike that of the great mass of
Saadi led the life of a dervish, or wand
passed most of his early years in travelling
to another. In the course of these journeys
by the Crusaders and put to labour on the for
Tripoli. He was redeemed from this slavery by
chant, who afterwards gave him his daughter in
with a dowry of an hundred pieces of gold. This
to in the 'Gulistan' (tale xxxi. of ch. ii., p. 99 of
translation, London, 1808). The lady sorely exer
poet's patience. 'Once,' says he, 'she reproached
ing, Art thou not he whom my father redeemed fr
vity amongst the Franks for ten dinars? I answered
ransomed me for ten dinars, and put me into yo
for a hundred.' A story of a livelier character is
meeting with a brother poet, Hemám of Tabriz,
rant of the name, and knowing only the birth-pl
companion, held out to him the bottom of a cup (t
zians were noted for their early baldness), and ask
are the heads of the Shirazians like this? The
turned the hollow of the cup to Hemám, and as
are the heads of the Tabrizians like *this?* H
his companion if he knew any of the verses o
the dervish repeated some of the most beautiful.
inquired, 'Do they make much esteem there of
of Hemám?' Saadi elegantly quoted a couplet
panion's:—

> 'Between the object of my love, Hemám, and me, a veil is drawn
> But it is time the veil should be drawn back, and we enjoy the
> another:'

and thus the illustrious poets were made acquainte

Another anecdote shows, in the fanciful la
Persian imagination, the high esteem in which th
of Saadi were held even during his lifetime. I
was fortunate enough to add a large share of this
of fame to the renown which 600 years have not d
A holy man of Shiraz, says the story, dreamed tha
all the angels of heaven singing a verse which he
understand, but which he was told was a couplet
and that it would be sung in heaven for a year to
the morning he went to the cell of the now recluse
found him repeating the distich:

> 'On the green trees the clear eye of the wise beholdeth
> In every leaf a book of the wisdom of God.'

Saadi died in 1291, at the age of 116 years, havi
it is said, 30 years in travelling and in military
during which, his wanderings reached as far as
one side, and Asia Minor, or perhaps Eastern
the other; 30 years in religious solitude, d
sults of his life of observation; and the 12
life in putting into a permanent form the fruits
ceding 60. During this long life he performed the

age to Mecca fifteen times; the first time in the company of his teacher, Abdolkadir Ghiláni. He lived under the patronage of the Atabeg princes, Saad Ben Zenghi, and his successor, Abubekir Ben Saad. From the former of these princes, his father, who was in the royal service, gave his son the name of Saadi: this in the East is a not unusual mode of naming both men and books, and the name is often so contrived as to form a sort of *jeu de mots*.

The works of Saadi, collected by Ahmed Nasik Ben Sesán, consist of the Gulistan, Bostan, Gazels (or odes), Kasaid (or elegies), Mokataat (fragments), Rubayat (quatrains), and essays of various kinds in prose. Of all these the best known are the Gulistan and the Bostan. The former is a collection of stories, in prose, but intermixed with verses of the author's own composition, or borrowed from the writings of others, a mode of writing which the Eastern imaginative writers much affect. The Gulistan is divided into eight chapters: on the morals of kings; on the morals of dervishes; on the excellency of contentment; on the advantages of taciturnity; on love and youth; on imbecility and old age; on the effects of education; and rules for conduct in life. The first seven chapters consist chiefly of moral stories, some of them apparently from real history, others fables, each in some degree bearing upon the subject of the chapter, and having its moral interwoven in its texture. The last chapter is rather a collection of apothegms, though a part of this also is narrative. These stories are not connected by a general thread of narrative, as is the case with most oriental collections (the reader will remember the general and subordinate stories which connect the histories of the Arabian Nights and the Fables of Pilpay); they follow one another without any link, except that of their allusion to a common subject. Of this book there have been many translations: into French by Du Ryer, who was French consul at Alexandria, Paris, 1634; into German by Olearius, who, in his preface, acknowledges the assistance of an old Persian literator named Hakwird, and mentions an earlier German translation made from the French of Du Ryer, and soon after the appearance of the latter. The translation of Olearius is preceded by a letter from his friend Dr. John Reinboth, containing a précis of Persian history, and followed by a translation of Lokman's Fables. The translation is spirited, and so are the copper-plates. This version was published at Sleswic in 1654, and a Dutch translation from the German appeared at Amsterdam in the same year. Olearius also translated the Bostan (a somewhat similar collection to the Gulistan, but all in verse) into German. The Gulistan has been translated into English by Gladwin, London, 1808; and by Ross for the Asiatic Society. There has also been a more recent French version than that of Du Ryer from the original by the Abbé Gaudin (1789). This translation is accompanied by 'An Historical Essay on the Legislation of Persia.'

The whole works of Saadi, in the original Persian and Arabic, were printed at Calcutta, in 2 vols. small folio, edited by Harrington (1791). The text of the Gulistan appeared first in the edition of Gentius, Amsterdam, accompanied by a Latin translation and notes. Gladwin published the text at Calcutta in 1806, which was reprinted in London in 1809. The text, with the translation in parallel columns (by Jas. Dumoulin), was printed at Calcutta in 1807, and there have since been more than one lithographed edition, one of which, we believe, has the Bostan on the margin—a form in which the two works often appear in manuscripts. Professor Falconer has given the Persian student an elegant selection from the Bostan, lithographed, containing about one-third of the whole work, and has also erted in the 'Asiatic Journal' several excellent versions of d stories, accompanied by the text, as collated several copies, and by critical notes. The Gulistan is one of the best text-books for learning Persian, and the edition of Gentius perhaps the best for this purpose, from the extraordinary beauty and clearness of the type (no unimportant matter when Persian letters are in question), the accompanying Latin translation. A good Life of di is given in the introduction to Harrington's edition of works (a translation from the Persian of Dowlet Shah); a briefer notice in D'Herbelot; and one of some length in Von Hammer's 'History of the Elegant Rhetoric of Persia' (*Geschichte der Schönen Redekünste Persiens*).

ALFELD is a principality about 170 square miles in ent, with 23,000 inhabitants, which, since the extinction the branch of Saxe-Gotha, and the partition of its territories among the three other branches, Saxe-Coburg, Meiningen, and Altenburg, belongs to Meiningen.

SAALFELD, the capital, is situated on the Saale, in a very pleasant country, and has two suburbs. The population is nearly 5000. There are manufactories of woollen-cloth, stuffs, leather, snuff and tobacco, succory, coffee, and cobalt; there are also vitriol and alum works, breweries, and a copper smelting-house on an island in the Saale, over which river there is a stone bridge of five arches. The town has four churches, a gymnasium, and two ducal palaces; the new palace, from which there is a very fine prospect, and the old palace, which contains the mint. The princes of Schwarzburg-Rudolstadt and of Reuss also make use of this mint.

SAAR-UNION. [RHIN, BAS.

SAARBRÜCK, or SAARBRÜCKEN, is the capital of a circle in the government of Trier (Treves), of the Prussian province of the Rhine, situated on the navigable river Saar, over which there is a stone bridge connecting the town with the suburb of St. John. It is a neat pleasant town, and the houses are all built of stone. It has a gymnasium, a Lutheran, a Calvinist, and a Roman Catholic church, and a synagogue. In this town are the court of justice for the circles of Saarbrück, Saarlouis, Ottweiler, and St. Wendel, a mining office, a salt-office, a custom-house, and other public offices. The inhabitants have manufactures of woollens, linen, tobacco, iron wire, porcelain, &c. They have also breweries, tanneries, and alum-works, and carry on a thriving trade by means of the river, especially in coals and timber. The population is nearly 5000, and, including the garrison, 7160. Saarbrück was formerly an independent county. The family of the counts becoming extinct in 1380, it fell to the house of Nassau, and was the residence of the princes of Nassau-Saarbrück, whose palace was reckoned one of the finest in Germany, but is now destroyed. By the treaty of Luneville, it was ceded to France, and made part of the departments of the Saar and of the Moselle. The congress of Vienna, in 1815, assigned it to Prussia.

SAARLOUIS, called during the French revolution Saarre-libre, is the extreme fortress of Prussia on the frontier next to France, which has been very much enlarged and strengthened since it has been in the possession of Prussia. It is situated in a plain on the left bank of the Saar, in the government of Trier, in the Rhine province. Including the garrison, the population is about 7000. The inhabitants manufacture iron and steel wire, hardwares, fire-arms, and leather. In the neighbourhood there are mines of iron and lead. There are considerable tanneries in the town, dock-yards for building vessels for the navigation of the Rhine, the Moselle, and the Saar. Saarlouis, like Saarbrück, is the seat of various public offices, has a gymnasium, one Protestant and two Roman Catholic churches, a synagogue, an hospital, an arsenal, and two barracks. The fortress was erected by Vauban in 1680, to defend Lorraine. By the treaty of Ryswick, in 1697, France was left in possession of it, and in 1705 it was besieged by the allies without success. By the treaty of Paris, Nov. 30, 1815, France was obliged to cede Saarlouis with three other fortresses to the allied powers, who assigned it, with the two banks of the Saar above Saarbrück, to Prussia.

SAATZ is a circle of the kingdom of Bohemia, the area of which is 900 square miles, with 130,000 inhabitants, the majority of whom are Germans. It is bounded by Saxony, and by the Bohemian circles of Leitmeritz, Rakonitz, Ellenbogen, and Pilsen. It is on the whole a mountainous tract. In the north is the Erzgebirge, and in the south a part of the middle Bohemian chain, which is one of the most fertile parts of the whole kingdom. The principal river is the Eger, which receives all the smaller streams. The chief products are corn, flax, hops, timber, silver, iron, tin, cobalt, lime, precious stones, and cattle. The inhabitants manufacture linen, calico, muslin, lace, paper, and wooden-ware. There are 27 towns and 464 villages in the circle. Saatz, the chief town, is situated on a considerable eminence on the right bank of the Eger, over which there is a chain bridge, 204 feet long and 18 broad. The town has a gymnasium, a handsome town-house, a large parish church, several other churches, and a Capuchin convent. The population is 5000.

SAAVEDRA, MIGUEL DE CERVANTES, the celebrated author of 'Don Quixote,' was born at Alcalá de Henares, on Sunday, the 9th of October, 1547, of an antient family originally from Galicia, which had for some time been established in Castile. His grandfather, Juan de Cervantes, was corregidor of Osuna. His mother belonged to the illustrious family of Barajas. Very little is known of the early life of Cervantes, except that he received his first education at the place of his birth, and gave very early proofs of talent. Having attained the proper age, Cervantes repaired to Salamanca, where he entered himself as a student at the university, and remained two years. He then went to Madrid, where his parents placed him under the tuition of Juan Lopez de Hoyos, a learned theologian, who filled the chair of belles-lettres in that city. Under him Cervantes seems to have made considerable progress. He himself informs us ('Viage al Parnaso,' p. 54) that he composed several romances or ballads, besides a pastoral called 'Filena;' and when, in 1569, his master published a collection of poems on the death of Isabella of Valois, wife of Philip II., there appeared, among the rest, two poetical compositions by Cervantes, whom he calls 'our dear and beloved pupil.'

In 1568 Cervantes entered the household of Cardinal Aquaviva, then at Madrid, and accompanied that prelate on his return to Rome. He remained with him one year, after which he entered the army, and served as a volunteer under Marco Antonio Colonna, the commander of the papal forces against the Turks. He greatly distinguished himself at the battle of Lepanto (Oct. 7, 1571). Though suffering at the time from intermittent fever, he took an active part in the combat, and received three arquebuse wounds, two in the breast, and one in his left hand, which maimed him for life. He continued to serve under Don Juan of Austria, and his successor in command, the Marquis of Santa Cruz, until 1575, when he revisited his native country, and spent some time at Madrid among his friends and relations. Having early in 1576 obtained a command in a regiment about to be sent to the Low Countries, Cervantes embarked with his elder brother Rodrigo, also a soldier, on board the Spanish galley El sol (the sun). On the 26th Sept. however, the galley was suddenly surrounded by an Algerine squadron, under the command of Arnaut Mami, who, after a most obstinate defence, boarded and took it, and carried his prize into Algiers. The crew and passengers were sold as slaves. Cervantes, who had fought with desperation on the boarding of the galley, was reserved by Mami for himself.

The numerous interesting details which Cervantes has given us in his novel 'El Cautivo' (the captive), and which have also come down to us from undoubted and impartial sources, display so much gallantry and magnanimity on his part, that they cannot be read without calling forth our admiration. After many bold but unsuccessful attempts to regain his liberty, by which he ran great risk of losing his life, Cervantes was redeemed in 1580 by the Fathers of Mercy, established for that purpose at Algiers, who paid to Hassan Aga, then his master, the enormous sum of 500 gold ducats, which had been raised among his friends and relatives. On his return to his native country, Cervantes, being destitute of all resources, again resumed the military profession, and served in three successive expeditions against the Azores. It was not till his return to Spain, in 1584, that he appeared as an author, having soon after published his 'Galatea,' a pastoral romance in prose and verse, in imitation of 'La Diana' of Montemayor, a species of composition much in fashion at that time. In this romance Cervantes personified himself, as well as the lady of his love, Doña Catalina Palacios y Salazar, whom he married in the same year (1584), under the names of Elicio and Galatea. He next devoted all his attention to the composition of dramas, of which he wrote upwards of thirty, and which, he informs us, were all acted with considerable applause. These are however all lost with the exception of two, 'El Trato de Argel' (Algerine dealing), and 'La Numancia.' But notwithstanding his theatrical success, Cervantes must have been in bad circumstances, since in 1588 we hear of him at Seville, where he filled the office of assistant-purveyor to the Indian fleets. That he was not content with his situation, and that it was an insignificant one, would appear from the fact of his having shortly afterwards, in 1590, made an application to be employed in the New World. At length, the purveyorship having been abolished and his office suppressed in 1596, Cervantes earned a scanty livelihood by becoming agent to various municipalities, corporations, and wealthy individuals. We have few traces of the mode in which he exercised his pen during this interval, and with the exception of two burlesque sonnets (estrambotes), one of which was intended to ridicule the ostentatious arrival of the Duke of Medina at Cadiz, after this town had been plundered and abandoned by the Earl of Essex, we hear of no other production of his genius. It is probable however that during his stay at Seville he wrote some, if not all, of his 'Novelas Exemplares,' which he subsequently published. From 1598, when he left Seville, to 1602, when we hear of him at Valladolid, there is a gap in the history of this great man, which all the diligence of his biographers has hitherto failed in filling up, it not being known where he resided or what pursuits he was engaged in. Some indeed are willing to supply the deficiency by supposing him to have been engaged as tithe-collector in La Mancha, and they add, that whilst fulfilling the duties of his office he was put in prison by the alcalde of Argamasilla, a small town of that province, and that he thus wrote the first part of his 'Don Quixote' in confinement. The accuracy with which the country of La Mancha and the manners and customs of its inhabitants are described in that work, is certainly in favour of the conjecture that he resided some time there; but Navarrete ('Vida de Cervantes,' p. 95) has shown that the report of his imprisonment rests on no other foundation than vague tradition. However this may be, Cervantes was at Valladolid in 1602. Three years after he published the first part of his 'Don Quixote,' which he dedicated to Don Alonso Lopez de Zuñiga y Sotomayor, seventh duke of Bejar. Though the work excited no great attention at first, it suddenly came into vogue, and was eagerly read by all classes of society. No less than four editions of it were printed in various parts of the Peninsula within the first year after its appearance (1605); two at Madrid, one at Valencia, and another at Lisbon. Its fame spread rapidly to all the neighbouring countries. But notwithstanding this enthusiastic reception of his work, Cervantes continued poor, and he was accordingly engaged by the duke of Lerma, the minister of Philip III., to write an account of the festivities, bull-fights, religious ceremonies, and so forth, with which lord Howard, ambassador of James I., was received at Valladolid in 1605. On the return of the court to Madrid in 1606, Cervantes followed it, and he continued to inhabit that city to the end of his life. In 1608 he brought out a correct edition of the first part of 'Don Quixote,' and in 1613 his 'Novelas Exemplares' (Exemplary Tales), twelve in number, by which his literary reputation was greatly increased. In 1614 he published his 'Viage al Parnaso' (Journey to Parnassus), a work which cannot properly be ranked in any particular class of literature, but which, next to 'Don Quixote,' is the most exquisite production of its immortal author. This work however being intended as a satire upon the bad poets of his time, some took offence at it, and became Cervantes' bitterest enemies. One, among others, published, under the assumed name of Alonso Fernandez de Avellaneda, a continuation of 'Don Quixote,' full of invective and abuse (Tarragona, 1614). This probably hastened the publication of the second part, which was sent to press early in 1615, with a dedication to his patron the Conde de Lemos. His other works are a collection of comedies and 'entremeses' (interludes) written in the fashion of the new school introduced by Lope de Vega, but which were never acted (Mad., 1615, 4to.); and a novel entitled 'Persiles y Sigismunda,' composed in a style very different from that of his other works, and certainly the least successful of all his productions. (Madrid and Barcelona, 1617.)

Cervantes died at Madrid on the same day as his great contemporary Shakspere, on the 23rd of April, 1616, being then in his sixty-ninth year. He was buried without the least pomp in the convent of the nuns of the Trinity in the Calle del Humilladero, where his daughter Doña Isabel had four years before taken the veil. But the nuns having removed to another convent in the Calle de Cantaranas, the old one was pulled down, and the remains of Cervantes were lost. Within the last few years however two monuments have been erected in Madrid to the memory of this great man: one, in the Plaza de las Cortes, consisting of a beautiful bronze statue upon a square pedestal of granite, on the sides of which are bas-reliefs representing subjects taken from 'Don Quixote;' the other is his bust in white marble over the door of the house in the Calle de Francos, where he lived and died.

His works have been too often analysed to render it necessary here to dwell upon their merits. His first publication, 'Galatea,' is beautiful in its spirit, interesting and pleasing in its details, but not original; as a work, it is cast in the same mould as other pastorals written before he

vantes had imagination and invention; he always
ı purity, frequently with elegance; but he was
: he wanted that severe taste, that power of con-
and ·perfect ear for harmony which form poetry.
herefore are, generally speaking, bad. But his mas-
Don Quixote,' is perfect in all its parts. The con-
admirable, and the author shows in every page a
losophic mind, the noblest sentiments expressed
table simplicity, and a perfect knowledge of the
art. Godwin said, 'At twenty, I thought "Don
aughable; at forty, I thought it clever. Now,
I look upon it as the most admirable book in the
d.' Of his 'Novelas,' or 'Tales,' it may be said
re not only interesting and amusing, but per-
l. The 'Voyage to Parnassus' is in many respects
iece of art, and the weapon of satire is handled
, but without ill nature.

of Cervantes has been written at great length by
e most eminent Spanish authors: Father Sar-
ayans, Los Rios, Fernandez, and Navarrete.
as spared no trouble in investigating the most
dents of the life of Cervantes, and has produced
ch, accompanied as it is by many original docu-
es nothing to desire. The editions of 'Don
ublished in and out of Spain since the death of
have been so numerous as to render it almost
o give anything like a correct list of them. We
ore mention only a few of the best:—Madrid,
ls. 4to., with engravings on copper; London,
wle, 6 vols. 4to.; Madrid, 1797, by Pellicer, 5
Madrid, 1819, by the Royal Academy of History,
; a new edition with a full commentary and criti-
he late Don Diego Clemencin, is now in course
on. As to translations, it is well known that
years after the publication of 'Don Quixote,' it
d into almost every European language, and that
on the Continent has so fully appreciated its
erits as our own, since we possess no less than
nt English versions besides several other works
s relating to it. Thomas Skelton was the first
ated it, London, 1620, 2 vols. 4to. Edmund
t published his 'Pleasant Notes upon Don
ondon, 1654, fol. J. Philips was the next who
t, London, 1687, fol. Motteux (Peter), a French-
h, published also a version, London, 1712, 4 vols.
ll (John), London, 1725, 4 vols. 12mo. Thomas
ondon, 1729, 2 vols. 8vo. Jarvis (Charles), Lon-
vols. 4to. Smollett, London, 1725, 2 vols. 4to.
ndon, 1755, 2 vols. 8vo. By far the best trans-
ming closer to the original than any other, is that
hich has often been reprinted.

Cervantes, por Navarrete, Madrid, 1819; Pel-
rcada, *Vida de Miguel de Cervantes*, Madrid,

small island in the West Indies, belonging
, is situated in 17° 40′ N. lat. and 63° 20′ W.
coast rises in perpendicular masses to a consi-
ation, and at a distance the island appears like a
rock. The shore is too steep to allow of land-
on the southern side, where an artificial path
de, which however is intricate, and admits only
t a time. By this path a small place is reached
lt in a secluded valley. The circumference of
oes not exceed nine miles, and its area is about
niles. The small portion of it which is culti-
ropriated to the growth of cotton, which the in-
rk into stockings, for sale as well as for their
he common vegetables of the West Indies come
. The population does not exceed 1500.

[SABAEI.]

LLA. [CEVADILLA; VERATRUM.]

(Σαβαῖοι), a people of Arabia Felix, on the bor-
Red Sea, in the northern part of the modern
hey are described by Diodorus and Strabo as the
ous, and, together with the Gerrhaei, as the
le in Arabia. Their country produced frankin-
h, cinnamon, and balsam in abundance, but was
by deadly serpents. The inhabitants are repre-
ing an idle life, on account of the abundance of
of the country, but are at the same time said to
on an extensive commerce with Syria and Me-
oth with the productions of their own country
h those of Ethiopia, to which they sailed in boats made of skins. The capital of their country is called Sabae by Diodorus, and Meriaba by Strabo, and is said to have been situated upon a mountain covered with trees. In this place the king resided, who might do anything that he pleased, except leaving his palace; and if he did, says Diodorus, he was stoned to death by the people, in pursuance of an antient oracle. (Strab., xvi., p. 778; Diod. Sic., iii. 46, 47; Plin., vi. 32.)

The country of the Sabaei is mentioned in the Old Testament under the name of Sheba (שְׁבָא), and is spoken of as rich in incense, spices, precious stones, and gold (1 *Kings*, x. 2; *Jer.*, vi. 20; *Is.*, lx. 6; *Ps.*, lxxii. 15), and as carrying on an extensive commerce with the other nations of Asia (*Ezek.*, xxvii. 22; *Job*, vi. 19; *Joel*, iii. 8). The queen of Sheba who visited Solomon (1 *Kings*, x. 1) is generally allowed to have come from this country, and not from Ethiopia, as Josephus relates (*Ant. Jud.*, viii. 6, sec. 5), who has confounded Sheba with Seba (סְבָא), which, as he tells us in another part of his work (ii. 10, sec. 2), was the antient name of Meroe. The Sabeans who are mentioned by Isaiah (xlv. 14) as 'men of stature' are probably the Ethiopian and not the Arabian people, and answer to Herodotus's description of the long-lived Ethiopians, who were 'the tallest and handsomest of all men' (Herod., iii. 20).

The capital of the Sabaei is called Saba by the Arabic writers, according to whom the founder of the city made in its immediate neighbourhood a vast mound or dam, to serve as a reservoir to receive the water which came from the mountains. Every family is said to have had a certain portion of this water distributed to them by aqueducts, and the building was reckoned so firm and strong that many of the inhabitants had their houses built upon it. But at length, say the Arabic writers, God being highly displeased at their great pride and insolence, and resolving to humble and disperse them, sent a mighty flood, which broke down the mound by night while the inhabitants were asleep, and carried away the whole city with the neighbouring towns and people. This inundation is said to have happened in the third century before the Christian æra; but if such were the case, it would appear from the account of Strabo that the Sabaeans had again recovered a large portion of their former prosperity.

(Korán, c. 34; Sale's *Preliminary Discourse to the Korán*, sect. 1; Pococke, *Specimen Historiæ Arabum*, p. 57; Edrisi, *Geographia Nubiensis*, p. 52.)

SABAISM was the name given to a religious system which antiently prevailed to a great extent in Arabia and Mesopotamia. Sabaism is frequently confounded with the Sabaei, and is sometimes described as the religion of the latter people; but the two words are quite distinct, and are written differently in the Semitic languages. The first letter in Sabaism is Tsade (צ), and consequently the word would be written more correctly Tsabaism.

Tsabaism was derived, according to its followers, from Tsabi, the son or brother of Enoch, but is more probably derived from their worshipping the 'Host of Heaven' (צְבָא הַשָּׁמַיִם). According to the Arabic writers, Tsabaism was the same as the religion of the antient Chaldæans, and appears to have been one of the earliest and simplest forms of idolatry. They believed in the unity of the Deity, but at the same time paid adoration to the stars, or the angels and intelligences, which they supposed to reside in them, and to govern the world under the supreme Deity. In the course of time images were made to represent the angels or intelligences dwelling in the stars; and the consequence of this would naturally be, that the common people would eventually worship them, as if they were gods. That the unity of the Deity was however still acknowledged in the religious system of the Tsabians is manifest from the way in which this religion is spoken of in the Korán; in which it is distinguished from polytheism, and is allowed to exist on the payment of tribute.

The religious books of Tsabaism were written in Syriac, and are referred to by early Arabic writers, but none of them are known in Europe. It appears that the Tsabians believed that the souls of wicked men would be punished for nine thousand years, and would afterwards be received to mercy. They were obliged to pray three times a day, at sunrise, noon, and sunset; and to observe three annual fasts, one of thirty days, another of nine, and a third of seven. They offered many sacrifices, but ate no part of them. They abstained from beans, garlick, and some other pulse and vegetables. They were accustomed to go on pilgrimage to Harran in Mesopotamia. (Prideaux. *Connection of the History of the Old and New Testament*, vol. i., p. 243, edition of 1821; Sale's *Preliminary Discourse to the Korân*, sect. i.; D'Herbelot, *Bibliothèque Orientale*, art. 'Sabi;' Hyde, *Religio Veterum Persarum*; compare also an Excursus to the third volume of Gesenius's *Isaiah*, 'On the Astral Worship of the Chaldæans.')

Tsabaism as a religious system no longer exists, but the name has been frequently, but incorrectly, applied to the Mandaites, or Christians of St. John, as they have been called. The name of Tsabians has been given to this sect by the Arabs, as they are accustomed to apply the term of Tsabians to many different religious sects. The Mandaites are found principally at the mouths of the Euphrates and near Bagdad, but they are not Christians, and the name of 'Christians of St. John' has been given to them in consequence of John being the name of the founder of their sect. From the manner in which John the Baptist is mentioned in the sacred books of the Mandaites, it appears that they supposed him to have been the founder of their religious system, and that his doctrines were corrupted by Christ. Their sacred books have been brought over to Europe; and an account of them is given by Silvestre de Sacy, in the *Journal des Savans*, Paris, 1819; but they are written in such a mystical style that it is exceedingly difficult to understand their meaning. There are three books—1, 'The Book of Adam;' 2, 'The Book of Yahya, or John the Baptist;' and, 3, 'The Kholasteh,' or Ritual. They are written in a peculiar character, which bears great resemblance to the Syriac or Western Aramæan; but the language in which they are composed more nearly resembles the Chaldaic or Eastern Aramæan. The greater part of the 'Book of Adam' was published, by Norberg, under the title of 'Codex Nasaræus, Liber Adami appellatus,' 5 vols. 4to., Lond. Goth., 1816-17. In the 'Book of Adam' the Christians, Jews, and Mohammedans are equally attacked; but the Mandaites appear to have adopted many things from Christianity, and they probably owe their origin to some of the Gnostic sects, which extensively prevailed in Asia.

SABBATH. The narrative in the book of Genesis of the creation of the world in six days is followed by these words: 'And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and set it apart; because that in it he had rested from all his work which God created and made.' (*Gen.*, ii. 2, 3.) These words seem to imply that the seventh day is to be observed by all the rational creatures of God as a day of worship in acknowledgement of their Creator, and as a day of rest in imitation of his rest after the creation. We find no further mention of this ordinance during the patriarchal period, though some have supposed that there is a reference to it in the intervals of *seven* days observed by Noah in sending the raven and the dove out of the ark. (*Gen.*, viii.) It is next met with at the time of the Exodus, under the name of the *Sabbath* (שַׁבָּת. from שָׁבַת, *to cease from labour*), where *rest* from labour is the peculiar character attached to the day. (*Exod.*, xvi.) In the passage referred to, it appears to be spoken of as an institution already known, but this has been disputed. It was still more expressly enjoined upon the Jews at the giving of the law on Mount Sinai, when the reason assigned in *Genesis* for its institution was repeated. (*Exod.*, xx. 8-11.) The Mosaic laws respecting the Sabbath are contained in the following passages, besides the two just quoted: *Exod.*, xxiii. 12; xxxi. 12-17; xxxiv. 21; xxxv. 1-3; *Levit.*, xix. 3, 30; xxiii. 3; xxvi. 2; *Numb.*, xv. 32-36; xxviii. 9, 10; *Deut.*, v. 12-15. It was a day of divine worship, though as to what that worship consisted in, we only know that there was to be an additional sacrifice besides the daily one, and a holy convocation of the people. This part of the institution was intended, like many others of the Mosaic laws, to keep in the remembrance of the people their allegiance to the true God, and to distinguish them from the idolatrous nations among whom they dwelt. (*Exod.*, xxxi. 13, 17.) Its other feature was rest from labour, which was to be observed not only by every Israelite, but by resident strangers and beasts of burthen. This rest had partly a religious character, as it was an acknowledgement of belief in the God who created the heavens and earth in six days, and rested on the seventh. For this reason a wilful violation of the rest of the Sabbath was punished by death, as it was an act of rebellion against God. A second object of this rest [illegible] of course, to afford leisure for the religious services of [illegible] day; and a third was the refreshment of man and [illegible] after the labour of the week. (*Exod.*, xxiii. 12.) [illegible] does not however define the meaning of the term [illegible] the Law; but it is evident from several passages in th [illegible] tateuch that it was peculiarly all work of a servile ch[illegible] that was forbidden. Thus there is a special comman[illegible] to rest on the Sabbath in seed-time and harvest, as w[illegible] at other seasons (*Exod.*, xxxiv. 21), and there [illegible] hibitions against kindling fire (*Exod.*, xxxv. 4) or p[illegible] food on the Sabbath (*Exod.*, xvi. 5, 22-30); the [illegible] severely reprimanded by Moses for going out o[illegible] to gather manna (*Exod.*, *ibid.*), and a man [illegible] death by the express command of God for gat[illegible] on the Sabbath. (*Numb.*, xv. 32-36.) This pe[illegible] of the Jewish Sabbath was intended constant[illegible] the people of their deliverance from their [illegible] in the land of Egypt, as Moses states in his re[illegible] Law, where the reason annexed to the fourth co[illegible] in *Exodus* is omitted, and its place is supplied [illegible] lowing words: 'And remember that thou wast [illegible] the land of Egypt, and that the Lord thy God b[illegible] out thence through a mighty hand and by a [illegible] arm; therefore the Lord thy God commanded [illegible] the Sabbath-day.' (*Deut.*, v. 15) All bodily [illegible] was necessary for the service of God formed [illegible] the statute. Thus the sacrifices were double[illegible] and the animals had to be killed; the perpetu[illegible] altar of burnt offering was to be supplied with wood [illegible] day; and a child was circumcised on the Sabb[illegible] day happened to be the eighth from its birth. [illegible] xxviii. 3-10; *Levit.*, vi. 8-13; *Matt.*, xii. 5 [illegible] 23.) It seems to be satisfactorily proved by [illegible] the unwillingness to fight on the Sabbath, [illegible] with in the later periods of the Jewish his[illegible] felt before the Babylonish captivity. The [illegible] the Jewish law concerning the Sabbath [illegible] from the following words of Isaiah (chap. lviii., [illegible] thou restrain thy foot from the Sabbath, from d[illegible] pleasure on my holy day; and call the Sabbath a [illegible] and the holy feast of the Lord honourable; and shalt [illegible] him (or it), not doing thine own ways, nor finding t[illegible] pleasure, nor speaking thine own words:' then [illegible] promise. The Sabbath was reckoned, like the J[illegible] in general, from sunset to sunset.

The Rabbins of later times added many [illegible] vexatious observances to the Mosaic law [illegible] such as the prohibition of travelling further on that [illegible] twelve miles, or, as it was afterwards settled, two th[illegible] cubits, that is, about one mile. For further in[illegible] these points the reader is referred to Lightfoot [illegible] Pitman, Index, art. 'Sabbath').

The word *Sabbath* was also used by the Jews as [illegible] name for their religious festivals, and also as equi[illegible] the word *week*. (*Levit.*, xxiii. 15; *Deut.*, xvi. 9, xxviii. 1; *Luke*, xviii. 12.)

The first teachers of Christianity abolished the [illegible] but introduced a similar institution in its [illegible] servance, namely, of the *first* day of the week [illegible] and of religious worship, in commemoration of God's [illegible] on the seventh day, and also more especially of the [illegible] rection of Christ. Hence it was called 'the Lord's [illegible] (ἡ κυριακὴ ἡμέρα), just as the ordinance by wh[illegible] death was commemorated was called 'the Lord [illegible] It has been held by many eminent divines that th[illegible] sufficient evidence in the New Testament for [illegible] stitution, that the change of the day from th[illegible] first day of the week is an insuperable di[illegible]lty. [illegible] Sabbath was a purely Jewish institution, and [illegible] it is not binding upon Christians. The chief [illegible] this discussion appear to have arisen from a [illegible] of the question, as if it were, not whether [illegible] church possesses *any* Sabbatical institution, but wh[illegible] *Jewish Sabbath* is binding upon Christians.

In its very nature the Sabbath appears to be [illegible] the whole human race. As a religious institution, [illegible] to keep in remembrance the God who created the [illegible] belongs equally to all men, since all are the creatures [illegible] same God, and all are prone to forget every rel[illegible] which is not continually and *regularly* forced [illegible] attention. As a day of rest, if needed at all (and [illegible] rally granted that such rest is necessary), it is ne[illegible]

ho wears the human body. Its appointment is
the creation of man, and long before the giving
sh law. These facts seem to prove that it was
be perpetual, which appears also to be indicated
rds of Christ (*Mark*, ii. 27), 'The Sabbath was
an,' that is, not for the Jews merely, but for the
e whole human race.

, can the time or character of its observance be
To determine this question, it must be remem-
he Sabbath is not a *moral*, but a *positive* insti-
r though it be a point of the highest moral
r man to worship his Creator, and though it be
the maintenance of such worship that it be ob-
xed intervals of time, yet there is nothing, as
an tell, in the nature of things to determine
nterval shall be. The appointment of every
for this purpose can therefore rest upon nothing
ress command of God; and this also seems to be
the text just quoted, 'the Sabbath was made
d not man for the Sabbath.' It is therefore,
ive institutions, susceptible of any change which
ircumstances of those for whose benefit it was
ay make desirable, provided that such change
competent authority. Now the *rest* of the Sab-
ourse, equally secured, on whichever day of the
s. Its *religious* purpose, as commemorative of
ing the world in six days and resting on the
ears to be sufficiently answered by its observance
h day. But, as a religious institution, it was
express more than this; it was designed to keep
ance the *peculiar character* of the religion of
ere to observe it, and hence it is susceptible of
which may make it better adapted to express
er. Thus under the patriarchal dispensation it
l to keep alive the worship of God as the creator,
to idolatry; and therefore it was observed on
hich God rested after finishing the creation:
God was known further as their deliverer from
Egypt, by which act they were constituted a
ple; and therefore the Sabbath was still ob-
with the additional character of strict abstinence
ile labour. The great fact of Christianity is the
of Christ, which was effected by the power of
d who created the world: this occurrence took
first day of the week; and to keep it in re-
we observe that day as our stated time of re-
hip; or, as Bishop Horsley states the matter,
; a Sabbath, we acknowledge a God, and declare
not atheists: by keeping one day in seven, we
ost idolatry, and acknowledge *that* God who in
g made the heavens and the earth: and by
r Sabbath on the first day of the week, we pro-
Judaism, and acknowledge *that* God who,
the world, sent his only begotten Son to redeem

ument be considered sufficient to prove that the
the seventh to the first day of the week is in
with the nature of the Sabbath, and with the
e Christian religion, it still remains to be shown
a matter of fact, the change was made upon the
Christ and the Apostles. There is no direct
the New Testament thus to set apart the first
eek. But, on more than one occasion, Christ,
with the Jews upon the mode of observing the
lemnly claimed for himself the prerogative of
of the Sabbath-day (*Matt.* xii., 8; *Mark*, ii.
vi. 5, xiii. 5; *John*, v. 8, 9), which seems to
e designed the Sabbath, modified in some way,
t of his religion. He seems, in fact, to announce
ental principle of *his* Sabbath in the words, 'I
ercy rather than sacrifice.' (*Matt.* xii. 7.) But
lebration of this day could not of course com-
e event occurred which it was designed to com-
amely, the resurrection of Christ. Now twice
ent we find the disciples met together for reli-
ip on the first day of the week, and again on
Pentecost, which was also the first day of
John, xx. 19, 24; *Acts*, ii. 1). In *Acts* (xx. 7)
ing of the disciples, on the first day of the
reak bread (that is, to celebrate the Lord's
of the most important parts of the Christian
spoken of as if it were a customary thing;
occasion referred to, Paul preached to them.
In the First Epistle to the Corinthians (xvi. 2), Paul commands the contributions for needy Christians to be laid by on the first day of the week. John expressly mentions the Lord's day as a time spent by himself in religious exercises (*Rev.*, i. 10). These allusions are perhaps scanty, but they are as much as we could expect, if the first Christians adopted the observance of this day without dispute; and the inference generally drawn from them is borne out by the voice of Christian antiquity. Pliny, in his celebrated letter to Trajan respecting the Christians (A.D. 107), says that they informed him that 'they were wont to meet on a certain day before day-break' for religious worship. (Plin., *Epist.* x. 97.) Ignatius, Justin Martyr, Dionysius of Corinth, Clement of Alexandria, Tertullian, Origen, and other early Christian writers speak of the Lord's day as observed among them (see the passages in Lardner's *Works*, vol. iv., p. 217, 218). Some of the early Christians, especially converts from Judaism, observed the Sabbath as well as the Lord's day, but this practice was not countenanced by the Apostles nor by the earliest Christian writers. (*Coloss.*, ii. 16; Lardner, *ibid.*). In examining the Fathers on this subject, it is necessary to remember that the Christian festival is always called by them the Lord's day, and not the Sabbath: where the latter word is used, it refers to the Jewish sabbath.

The Sabbath is used in the New Testament as a type of the eternal rest of heaven: 'there remaineth a rest (or sabbath-keeping, σαββατισμὸς) to the people of God.' (*Heb.*, iv. 9.) Some understand this passage of the Christian Sabbath.

(Michaelis *On the Laws of Moses*, arts. 194, 196; Lightfoot's *Works*, see the *Index*; Horsley's *Sermons*, 21, 23; Wardlaw *On the Sabbath;* Winer's *Biblisches Realwörterbuch*, art. 'Sabbath.')

SABBA'TIA, a genus of North American plants, belonging to the natural order Gentianaceæ. The genus is known by a 5-12-parted calyx, rotate 5-12-parted corolla, withering on its capsule, revolute anthers, stigma with two straight arms, becoming at length spirally twisted, and a one-celled capsule, with the valves turned a little inwards. There are several species of Sabbatia, all of which are characterised by the possession of a pure bitter principle, and on this account they are extensively used, in North America, in intermittent and remittent fevers, and as tonics. The species most commonly used is the *S. angularis*. It attains a height of one or two feet, and is known by its erect, square, winged stem; opposite, heart-shaped, 5-nerved, smooth, acute leaves; terminal flowers; angular, tubular, 5-parted calyx; 5-parted corolla, with segments twice as long as the calyx; ovate ovary; declined style, and one-celled capsule. It grows in damp wet soils, in the United States, and is common in moist meadows among high grass.

SABATI'NI, FRANCISCO, a Spanish architect, was born at Palermo, in 1722. Having completed his studies in literature and mathematics in his native city, he made choice of architecture as a profession, and visited Rome for the purpose of perfecting himself in it. On leaving Rome for Naples, he was employed as the second overseer of the works at the palace of Caserta, under his father-in-law, Luigi Vanvitelli, the architect of that immense edifice. While thus employed, the king bestowed upon him a commission of lieutenant in the artillery, and charged him with the erection of the cavalry barracks near the Ponte della Maddalena, and the arsenal armoury. When, on the death of his brother Ferdinand, the king succeeded to the throne of Spain as Charles III., in 1759, Sabatini settled at Madrid, where, besides being extensively employed in his profession, he rose to considerable military rank, being made lieutenant-general in 1790, and inspector-general of engineers in 1792, and had various appointments and distinctions conferred upon him. He made some additions and alterations at the royal palace of Madrid, and also at those of Aranjuez and the Pardo. Among his chief works in the capital are the Aduana, or Custom-house, the gate of Alcalá (a magnificent façade, with three lofty arches and two other entrances, making in all five openings through both fronts), and that of San Vincente, and the royal porcelain manufactory at Buen Retiro. He also designed the mausoleum of Ferdinand VI., in the church de las Salesas, the chapel in honour of Palafox in the cathedral of Osma, the grand altar in that of Segovia, and various other structures, both ecclesiastical and secular, including the arsenal at Caracas, and other works in Spanish America. He died at Madrid, December 19, 1798, with the reputation of great skill and judgment in his profession, and of an unusually correct taste.

SABELLA. [TUBICOLIDÆ.]

SABELLA'RIA. [TUBICOLIDÆ.]

SABELLIANS, an heretical Christian sect, which arose about the middle of the third century. They were the followers of Sabellius, an African bishop or presbyter, who resided in the Pentapolis of Cyrenaica. They held that there was only one person in the Godhead, namely, the Father; that Christ was a mere man, but that there resided in him a certain energy proceeding from God, or a portion of the divine nature; and they likewise deemed the Holy Spirit merely a divine energy, or an emanation proceeding from God. They illustrated their doctrines by comparing God to the sun, the Word to its illuminating power, and the Holy Ghost to its warming energy. They were successfully opposed by Dionysius of Alexandria, but continued for a long time to be an important sect. (Lardner's *Credibility* and *History of Heretics*; Neander's *Kirchengeschichte*; Mosheim's *Ecclesiastical History.*)

SA'BIA, a genus of plants named by Mr. Colebrooke from the Indian name, *sabja*, of one of the species. It is usually referred to the natural family Terebinthaceæ, but it is now attached as an anomalous genus to the group Anacardiæ which is separated from them. The genus was found originally in the Silhet Mountains, whence it extends to Nepaul and the more northern part of the Himalayas, where it is found at considerable elevations. It is characterised by having the calyx small, five-leaved; petals five, lanceolate; filaments five, shorter than the petals inserted at their base; anthers round; ovary superior, round; style short; stigma simple; drupe reniform, pulpy, and of a dark blue colour. The species form ornamental climbing-shrubs, with smooth lanceolate alternate leaves suited to the shrubberies of this country.

SABINE, River. [LOUISIANA; MEXICAN STATES.]

SABINES, SABINI, SABINA, SABINUM. [RIETI; ROME—*Antient History*.]

SABINIA'NUS of Volterra was elected bishop of Rome after the death of Gregory I., or the Great, A.D. 604. He had been employed on a mission to the court of Phocas, the usurper of the Eastern empire. He is said to have shown himself avaricious and fond of hoarding, and to have thereby incurred the popular hatred. If such was the case, he was very different from his predecessor, who was very generous towards the poor. Sabinianus died in about eighteen months after his election, A.D. 605, and was succeeded, after a vacancy of nearly one year, by Boniface III., the first bishop of Rome who was acknowledged by the imperial court of Constantinople as primate of the whole church.

SABINUS MASSURIUS. [ROME—*Roman Law*.]

SABI'NUS, AULUS, a Roman poet, was a contemporary and friend of Ovid, whom he followed and imitated in that species of poetry of which Ovid has left specimens in his 'Heroides.' All we know of him is that he died at an early age, and that he wrote a series of Epistles (Heroides), supposed to be addressed by heroes to heroines, and to be the answers to those epistles which Ovid had addressed to the heroes in the name of the heroines. The Heroides of Sabinus, according to Ovid (*Amor.*, ii. 18, 27, &c.), were—Ulysses to Penelope, Hippolytus to Phædra, Æneas to Elissa, Demophoon to Phyllis, Jason to Hypsipyle, and Phaon to Sappho. (Comp. Ovid, *Ex Pont.*, iv. 16. 13.)

There are extant only three Heroides, Ulysses to Penelope, Demophoon to Phyllis, and Paris to Oenone, which are generally ascribed to Sabinus. It has been doubted, by G. Vossius and others, whether these poems really belong to Sabinus; but J. Ch. Jahn (*De Publ. Ovid. Nason. et A. Sabini Epistolis Dissert.*, pars. i., Lips., 1826) and all modern editors of Ovid have maintained that they belong to Sabinus. They are however in every respect inferior to the poems of Ovid; the style is deficient in animation, and the poet's imagination seems to have been very limited.

The poems of Sabinus are generally printed at the end of the works of Ovid, and also in the separate editions of the Heroides of Ovid. (See *Ovidii et Auli Sabini Epistolæ, cum annotat., &c.*, by Vitus Loers, Coloniæ, 1829-30, 8vo. This edition is preceded by a valuable introduction on the poems of Ovid and Sabinus.

SABLE. [WEASELS.]

SABLES D'OLONNE. [VENDÉE.]

SACBUT (*Saquebute*, Fr.), the name formerly given in England to the TROMBONE, which see.

SACCHAROMETER, an instrument used principally in the operations of brewing and making sugar. It serves to indicate the density of the liquid extracted from malt, or the degrees to which the juice expressed from the sugar-cane is concentrated previously to undergoing the process of crystallization; and an instrument of the like kind, called a lactometer, is employed to exhibit the density of milk. Both of them are formed on the same principle as the hydrometer [HYDROMETER], and such instruments are sometimes comprehended under the word aræometer, or gravimeter. Their general use is to determine, when extreme accuracy is not required, the specific gravities of liquids which are of greater density than water, and even those of solid bodies in small quantities.

The saccharometer which is most commonly employed is made of copper, and differs in form from the instrument represented in the article HYDROMETER only in its stem, which is six inches long, having four equal faces, each less than a quarter of an inch in breadth. Three of these faces are graduated, and the volume and weight of the whole are such, that when the instrument is immersed in water it sinks till the top of the stem is but little above the surface. The line at which the surface of the water cuts the stem is marked as the zero of the scale; and the graduations are such, that when the instrument is immersed and floats upright in a vessel containing the saccharine matter, the number of the division at the surface expresses the density of the liquid by the number of pounds avoirdupois which ought to be added to the weight of a barrel of water, in order to show the weight of an equal volume of the liquid.

The lowest graduation on the first face of numbered 20; and if the density of the liquid be the instrument floats with that division at the s applying a certain weight (No. 1) at the top of the instrument will sink till a point near the top the surface, and a division at that place is n on the second face. The graduations on this serve to indicate all densities from twenty poun pounds per barrel above the weight of a barrel Again, if the density of the liquid be such that ment floats with the number 40 at the surface, a certain other weight (No. 2) instead of No. of the stem the instrument will sink to a point top; and at this point is the division numbered third face. The graduations on this face serve to all densities from forty pounds to sixty pounds

The instrument made by MM. Dring and plied with an ivory scale, divided into one hu which are numbered from 50 to 150, to repr a Fahrenheit's thermometer; this slides upon box-wood, which is graduated so as to show gravity of the liquid, that of water being 1000, tity per cent., and the quantity per barrel of d taken up with the wort in mashing, and the cent. of gallons of proof spirit which might be the wort. Having found the temperature of the thermometer, and its density by the number on the the floating saccharometer at the surface of the degree of temperature on the ivory scale is put dence with the degree of density on the box-wood scale then, opposite to any other degree of temperat ivory scale will be found, by inspection on the the specific gravity, &c. corresponding to that tem

A more simple instrument of the like kind is made of glass.

For the general purpose of determining the speci of fluids on the principle of the hydrometer and meter, the best instrument is one which consists cylinder about seven inches long and three-quarters inch in diameter. It has at its lower extremity a carrying a small cup in the form of an inverted its opposite part is drawn out so as to form a ste or tube, which is terminated at the up ext small cup. About the middle of the st and, in order that the instrument may vertically in a vessel containing the liquid wh gravity is to be determined, a constant weight, wh be a ball of glass containing mercury, is placed in cup.

To find the specific gravity of the liquid, let whole weight of the instrument, including the weight in the lower cup, and let *w* be a w when put in the upper cup, will cause the i sink in the liquid till the above-mentioned

the level of the surface; also let w' be the weight
l cause the instrument to sink in distilled water
me mark comes to the surface. Then, since the
f the immersed part of the instrument are the
the weights of the instrument, including the ball,
er, and the additional weights in the upper cup,
to the weights of the fluid displaced; those weights
another in the same ratio as the specific gravities
nd of the liquid. Therefore $\frac{W + w}{W + w'}$ expresses
c gravity of the liquid, that of water being unity.
the determination of the specific gravities of
o part of the ordinary use of a saccharometer, yet,
be sometimes convenient to employ the instrument
urpose, it will not be improper to state here the
which the determination may be made; the weight
d being supposed to be less than w'.
he instrument in distilled water, the ball of mer-
in the lower cup, and put the solid in the upper
as much additional weight ($=p$) as will sink the
the mark above-mentioned on the stem; then
he weight of the solid. Next, place the solid in
cup, and, because it will lose weight by being im-
the water, let p' be the additional weight which
laced in the upper cup, in order to sink the instru-
n to the mark; then p' (the weight lost by im-
s the weight of a volume of water equal to that
lid. Consequently $\frac{w'-p}{p'}$ expresses the specific
the solid, that of water being unity.

HARUM, the name of a genus of plants of the
mily of Gramineæ, and also of that of the well
oduct Sugar. The derivation of the name from
source will be evident when we have briefly con-
history. The name (σάκχαρ, σάκχαρον, and σάκχαρι)
Greek authors, though it has been supposed, ap-
n insufficient grounds, that the saccharum of the
as not our sugar, but some other unknown sub-
ich by others has been supposed to be *Tabasheer*.
ion, promulgated by Salmasius, it would be un-
to reply to, if it had not been adopted by the
Humboldt, as well as by Sprengel, in his 'Com-
on Dioscorides,' in Kühn's edition of that author.
to have originated from the generic term *kusb*
en applied by the Arabs to the bamboo-reed, as
he stem of the sugar-plant, which is distinguished
l Shukur. Sugar and tabasheer are both Indian
which are mentioned by old Sanscrit authors; the
therefore to ascertain is the period when they
nown to other nations. The Arab authors on
and Materia Medica, though much neglected,
siderable advantages in such inquiries. We know
an Christians assisted them, or rather actually
translations from Greek into Arabic; and we
y had the most satisfactory evidence that Hindu
were, at the same time, present at the court of
Rashid. We may therefore place some confidence
mes and synonyms employed by Arab authors.
is mentioned in early Sanscrit works on medi-
was therefore introduced by the Arabs into theirs.
in Sanscrit is Twak-kshira, which is, no doubt,
of the Tabasheer; khir, kshir, or chir, according
sor Wilson, signifying milk, milky-juice, or ex-
is substance is secreted by, and, as is now well
eposited in the hollow stems of bamboos. It is
of nearly pure silex, and is as hard and as taste-
iece of quartz crystal. This was not likely to be,
, confounded by the Arabs with sugar, which is
by them, with one kind of manna, under the
kur, which in Persia is *shukkur*, and both, no
ived from the Indian names, which, in Tamool, is
nd in Sanscrit, *sarkara*: whence also the Indian
gery must be derived, as sugar-candy from *shukur*
these are too similar to the Greek word (σάκχαρον)
have any other origin, and there is nothing very
e in sugar being known to the Greeks, as well as
ther Indian products which entered into the exten-
rce of the antients with India. That the proper-
milar is evident from Dioscorides treating of sugar,
ely after the different kinds of honey, in the chap-
e Saccharum of Honey' (περὶ σακχάρου μέλιτος).
17) clearly describes it. Other instances may be adduced of sugar being called honey, especially at earlier periods, when the Indian name of sugar was probably unknown. Nearchus, as quoted by Strabo (xv., p. 894. Casaub.), calls it honey of canes: it is mentioned by Theophrastus as honey from reeds or canes; while Herodotus (iv. 193) states that the Zygantes, or Gyzantes, besides having honey prepared by bees, had a much greater quantity made by the hands of men, which is supposed to have been sugar in some of its forms. Dr. Harris inquires whether the term *shukur*, so frequently employed in Scripture, translated strong drink, and always coupled with wine, be not sugar? The production of manufactured articles in India is of very antient date, as Beckman observes, and as may be seen in the case of indigo.

The sugar-cane was introduced by the Saracens into the South of Europe, but the period is not well ascertained. Gibbon says they introduced it into Sicily soon after they got possession of the island. About the year 1420 sugar was much cultivated by the Portuguese in Madeira. In 1503 we read of sugar being imported from the Canaries, and in 1506 sugar-canes were carried thence to Hispaniola in the West Indies. But, besides the Indian cane, another, and a much more prolific kind, that of Otaheite, was introduced into the West Indies about 1794, and about the same time, or in 1796, the China sugar-cane was introduced into India. The Chinese and Indians seem both therefore to have had independent means, that is, distinct plants from which they could extract sugar; and, as history shows, they did so at very early periods. [SUGAR.]

The genus Saccharum contains numerous species, which are usually easily distinguished by their highly ornamental nature, by the light and feathery or rather silklike inflorescence. The species are widely distributed through the tropical parts of the world. The genus is distinguished by the spikelets being all fertile and in pairs, one sessile, the other stalked, articulated at the base, two-flowered, the lower floret neuter with one palea, the upper hermaphrodite with two paleæ. Glumes two, membranous. Paleæ transparent, awnless; those of the hermaphrodite flowers minute, unequal. Stamens three. Ovary smooth; styles two, long; stigmas feathered with simple dentated hairs. Scales two, distinct, obscurely two or three-lobed at the point. Caryopsis smooth.

S. officinarum, the best known species, or that yielding sugar in India, is cultivated in all parts of that country, and several varieties are known. It was introduced into the South of Europe and the Canaries, and thence into the West Indies. Another species, introduced from China, was named *S. sinense* by Dr. Roxburgh. It was extensively distributed throughout India, and still is so to some extent, as the canes are large, rich in juice, and hard enough to resist the attacks of the white ants. Within the last few years, the Otaheite sugar-cane has been introduced from the Mauritius into India, and rapidly spread through the country. It is no doubt the same species that was many years since introduced into the West Indies. It is probably the 'Canne de Haite' of Tussac, or *Saccharum violaceum*.

Some of the species of Saccharum, owing to the silex in their cuticle, are so durable, that they are employed in India for thatching, such as *S. canaliculatum* and *S. cylindricum*. This is the case with *S. spontaneum*, which also makes good mats. The natives of Bengal make their pens of the hollow stems of *S. semidecumbens* and of *S. fuscum*. The latter, as well as the culms of *S. porcerum*, are also used for screens and light fences, and other economical purposes.

SACCHETTI, FRANCO. This eminent contemporary of Boccaccio, who was distinguished, like him, though in less degree, as an Italian novelist, was one of the earliest cultivators of a prose style in the language. The precise date of his birth is not known, but Bottari has fixed it about 1335, for which he alleges various proofs derived both from Franco's own writings and other circumstances. His father was Benci di Uguccione, of the Sachetti family, one of the most considerable in Florence. He appears to have received an education of a superior kind, and to have been well versed not only in polite literature, but in severer studies; and that he was above the prejudices of his age, is proved by one or two of his tales, wherein he derides the pretended science of astrology, and inveighs against that false and mistaken devotion which substitutes superstitious observances for genuine piety. Literary studies however were to him rather relaxations from more serious duties than his chief occupation; for he was actively engaged in public life, and at various times, filled many important offices which were conferred on him by his fellow-citizens. From what he says in one of his canzoni, it appears that in the earlier part of his life he visited 'Sclavonia,' for he describes the rude unpolished habits and manners of the people, and his eagerness to see Florence again. It is probable therefore that he was engaged there in commercial affairs, it being then the custom for Florentine and other Italian merchants to establish themselves in foreign countries. In 1383 he filled the office of one of the magistrates Degli Otto, or Council of Eight, at Florence; and two years afterwards was chosen, much against his inclination, as ambassador from the republic to Genoa, but he escaped that honour by happening at the same time to be elected podestà, or chief magistrate, of Bibbiena. He afterwards held the same office, first at San Miniato, and, in 1396, at Faenza, which latter he accepted merely because its emoluments were of consequence to him in his then straitened circumstances.

The time of his death is as much matter of uncertainty as that of his birth. Crescimbeni makes him live till after 1410, while Bottari conjectures that he must have died shortly after the beginning of the century. He was thrice married: first, in 1354, to Felicità, daughter of Niccolo Strozzi, to whom he was greatly attached, and by whom he had several children; secondly, in 1387; and lastly in 1396, when, supposing him to have been born in 1335, he was in his sixty-first year, which is one of the reasons brought forward by his biographer for assuming that he could not have been born much earlier than the date he assigns; yet in itself it is a most inconclusive circumstance. By his first wife he had several children, of whom only Filippo and Niccolo survived him. The latter, who was gonfaloniere at Florence in 1419, had a son named Franco, a person of some literary distinction among his contemporaries, which circumstance has led several writers to confound the grandfather and grandson, or rather to attribute the works of both to the same individual, whom they describe as an eminent poet and historian, and writer of tales.

Although his sonnets, canzoni, capitoli, and other metrical compositions obtained for him great repute as a poet among his contemporaries and his countrymen, it is chiefly by his 'Novelle' that the elder Franco is now known as a writer. It is singular however that although the 'Novelle' had previously been quoted as authorities for the language in the dictionary 'Della Crusca,' and spoken of by critics as next, both in style and merit, to those of Boccaccio, they existed only in manuscript copies until 1724, when they first issued from the press, edited by Bottari. The collection originally consisted of three hundred tales, but of that number only two hundred and fifty-five now remain. They do not show much invention, nor indeed do they correspond to their title, being for the most part not narratives, but merely short anecdotes, whose matter is frequently very trivial, owing to which their interest now consists almost entirely in their relating to historical personages, and in their throwing light upon many customs and other obscure matters. Some of them have been appropriated and adapted by modern writers: Bürger, for instance, has taken Sacchetti's fourth novella, and transformed it into his popular comic ballad entitled the 'Emperor and Abbot,' without mentioning the source of it.

Bottari mentions a comic poem entitled 'La Battaglia delle Vecchie colle Fanciulle,' existing in manuscript in the Gaddi Library, as attributed to Sacchetti, merely observing that he had never been able to procure a sight of it. This production, which is in two cantos, and consists altogether of only one hundred and thirty stanzas in *rima ottava*, was printed for the first time at Bologna in 1819, and dedicated to Lord Byron: and has since been reprinted in the 'Scelta di Poemi Giocosi,' published by Bettoni at Milan, 1833. Amati, the first editor, supposes it to have been written about 1354, and it may be allowed to entitle Sacchetti to the honour of being considered the father of Italian heroic-comic poetry.

SACCHETTI, GIAMBATTISTA, was born at Turin, where he studied architecture under Juvara, who, in his last illness, recommended him as his successor for carrying into execution the designs for the new palace at Madrid. He was accordingly summoned to that capital by Philip V. in 1736. The original design by Juvara was upon a most extraordinary scale, the plan forming altogether a square of 1700 feet to the side: but as the king insisted upon the new edifice being erected on the precise site of the former one (destroyed by fire in 1734), notwithstanding all r strances and advice to the contrary, both on the part architect and of many other individuals, Juvara's was laid aside altogether, and his successor had to pre an entirely new one, in which the plan was greatly cur being reduced to a square of 470 feet. Even thus ab the present edifice (begun in April, 1737) is a vast one of unusual loftiness; for, owing to the great d the ground, the height in some parts is about 150 including those in the substructure and basement no fewer than nine different floors. But so ranges of windows do not contribute to gran contrary, they occasion a certain character of li give the whole the appearance of being too n and crowded. This important work occupied much as to leave him little leisure for anything el portance, except completing the façade of the p Ildefonso as designed by Juvara. He was also the public school of architecture at Madrid; and Academy of St. Ferdinand being established, 1752, complimented with the honorary title of director in excused, on account of his other avocations, fr to its duties. Ill health at length compelled his professional engagements altogether in 1760, previously to his death, which did not happen till 3, 1764.

SACCHI, ANDREA, one of the greatest masters of the Roman school of painting, was the natural son of Benedetto Sacchi, an obscure painter, and was born in the vicinity of Rome, 1599. He acquired the rudiments of his art from his father, who, perceiving the ability of his son, placed him at an early age in the studio of Albano, with whom he remained several years. He soon distinguished himself as the most promising of all Albano's scholars, and in a short time surpassed his master also, whom, while still his pupil, he excelled in every respect.

Sacchi enjoyed a local reputation while very yo upon the accession of Urban VIII. in 1623, thro interest with the Barberini family, he was execute one of the great altar-pieces of St. Peter's; and painted a large picture for the altar of Gregory the G representing the performance of a miracle by t This piece, which in 1771 was executed in mosaic ander Cocchi, is a grand composition, equally cons for correctness of design and simplicity and h colouring, and it established Sacchi's fame: and a gorical composition, representing the Divine Wisd he executed in fresco in the Barberini Palace for Antonio Barberini, the nephew of Urban VIII. Sacchi the reputation of being the greatest m He painted many other works for the sa granted him a pension for life.

His next great work was St. Romualdo relati to five monks of his order, which is conside masterpiece, and, notwithstanding its remarkable both of composition and colour, has been gene nounced to be one of the four finest works in R scene is in the valley of Camaldoli in the Apennines the saint is represented seated at the foot of a great the monks are standing in simple and attentive around him; all the figures are similarly attired but the shadow of the tree is so admirably arra give the whole a pleasing and grand effect. Th was carried away by the French, but it is now museum of the Vatican; it has been excellently e by Frey. Sacchi also executed the following great the Death of St. Ann (also engraved by Frey): the of St. Antony; St. Joseph; St. Andrew; and tures from the life of John the Baptist, for the c San Giovanni in Laterano; and others of l ance.

Considering the great powers of Sacchi and the age which he lived, he produced remarkably few pictures It was a maxim with him that the merit of a paint consisted not in executing much of moderate merit, little and excellent; he was however a man of decid dilatory habits. He spent much of his time in plating the great works of his favourite masters, a the pictures in Rome those which he most ad the Transfiguration by Raphael, the Commun St. Jerome by Domenichino, and St. Peter healing the by Cigoli (since destroyed). When reproached for activity, he used to reply that Raphael and tened him and filled him with despair. His of Raphael amounted to absolute veneration; temporary Passeri relates that occasionally when ne of his scholars had shown him a study from that ater, he has been led away from the consideration before him into the contemplation of the great o. he designer, and has passionately exclaimed, they would make me believe that Raphael was a , he was an angel.' And when he made a tour he north of Italy, subsequently to his painting the lo, for the purpose of examining the works of the and the Venetian masters, being much struck the delicacy and richness of effect of Correggio and he expected to feel a deficiency in the works of el upon his return to Rome; but immediately he ne Mass of Bolsena in the Vatican he exclaimed, re I find not only Titian and Correggio, but Raphael

cchi's manner of execution was very broad, and his ring subdued and perfectly harmonious; he is con- d, after Raphael, the best colourist of the Roman l. His design was pure and grand; and his composi- equally natural and simple: repose and dignity of ter prevail throughout all his works. His forms are y classical, though natural; he was thoroughly ac- nted with the great works of antiquity. He preferred style and proportions of the Antinous to those of any er antient statue; and he was as profound in the theory he was excellent in the practice of his art. Sacchi died 661. He had many imitators, and notwithstanding the valry of Pietro da Cortona and the opposition of Bernini, he formed a numerous and celebrated school. Nicolas Poussin attended his academy, but his greatest scholar was Carlo Maratta, who, after the death of Sacchi, became the leader of the faction which was opposed to the imitators of Cortona. [ROMAN SCHOOL OF PAINTING.] (Passeri; Lanzi; Fiorillo.)

SACCHI'NI, ANTONIO GASPARO, a composer, whose strains once resounded in every lyric theatre in Europe, but of whom little more than the name remains, was born at Naples, in 1735, and there educated, at the *Conservatorio di Santa Maria*, under the once famous Durante, who himself is now nearly forgotten. So successful were Sacchini's studies, that the moment they were eted he was engaged to compose an opera for Milan, er he proceeded for the purpose; but there the *a donna* made so sudden and so deep an impression mind always too susceptible, that to her he devoted time that ought to have been bestowed on his work, ch at length he was compelled to begin and finish, are told, in four days. This was *L'Isola d'Amore*, opera that pleased not only the public, but the critics. chini then went to Venice, next to Stuttgard, afterwards London, and finally to Paris, in which cities his numerous eras were performed, but with most success in the last, ere he set his music to French words for the *Académie ale*. The Parisians, Dr. Burney tells us, almost adored chini, and when he died—overwhelmed with debt and austed with gout—in 1786, he was honoured with a endid public funeral, at which Piccini, once his rival, w his panegyrist, spoke his *éloge*.

SACCOLA'BIUM, a genus of plants of the tribe Vandeæ d natural family of Orchideæ, now extensively culti- ed in hothouses especially dedicated to their cultivation. is is an Asiatic genus, found in the Indian archipelago, Malayan peninsula, and thence extending north along the malayan Mountains to 30° 4′ N. lat., where *S. guttatum* is nd on trees, as well as in more southern latitudes. The nus consists of caulescent epiphytes, with two-rowed riaceous leaves, which are often oblique at the apex. The owers are axillary, and either racemose or solitary.

SA'CCOMYS. [MURIDÆ, vol. xv., p. 514; RODENTIA, xx., p. 62.]

SACER MORBUS (Ἱερὰ Νόσος), a term applied appa- ently by the antients to more than one disease, as Athe- s (*Deipnosoph.*, lib. vii., § 33, p. 289) speaks of τὰς ἱερὰς αλουμένας νόσους, and Heraclitus is said by Diogenes aertius (*De Vit. Philosoph.*, lib. ix., cap. i., § 6 and 7) to e called Arrogance by that name: τήν τε οἴησιν ἱερὰν νόσον λεγε. Generally however it is merely used as one of the umerous names of epilepsy [EPILEPSY], and this is the mation given by Hesychius and Suidas *in voc.* It is used by the author of the treatise Περὶ Ἱερῆς Νόσου, 'De Morbo Sacro,' which is published among the works of Hippocrates (tom. i., p. 587, ed. Kühn), though it was probably written by one of his successors in the Dogmatic school: (See Gruner, 'Censura Libr. Hippocr.,' Vratislav., 1772, 8vo., § 44, p. 162; and Ackermann, *Hist. Liter. Hippocr.*, *ap. Fabricii Biblioth. Gr.*, ed. Harles, and Kühn's *Hippocr.*, tom. i.) The term is also found in Aretaeus (*De Caus. et Sign. Diuturn. Morb.*, lib. i., cap. 4), Theophanes Nonnus (*Epit. de Curat. Morb.*, cap. 36), Artemidorus (*Oneirocrit.*, lib. ii., cap. 12, where see Reiff's note 35), and others. The meaning of the term is obscure and uncertain, and several derivations of it are mentioned by Aretæus (*loco cit.*): 'There is' (says he, in Dr. Reynolds's Translation) 'a sort of ignominy too in the character of epilepsy, for it seems to attack those who offend the moon, and hence the disease is termed "sacred;" or it may be from other reasons, either from its magnitude (for what is great is "sacred"), or from the cure not being in the power of man but of God, or from the notion that a demon has entered the patient, or from all put together, that it has been so called.' The author of a treatise 'De Morbo Sacro' seems to have considered the origin of the term to have arisen from the belief either that this disease proceeds more immediately from the anger of the gods, or that it is more wonderful than others, or that its cure depends more entirely upon divine assistance; as he refutes all these opinions at some length. (See also Galen, *Comment.* vi., in Hippocr. *Epidem.*, lib. vi., tom. xvii. B., p. 341, ed. Kühn.) The other reason that is given, viz. 'the magnitude of the disease,' is supported by the author of the 'Schol. MS. in Gregor. Nazianz. in Bastii Excerptis,' quoted in Gaisford's Suidas: τινὲς ἱερὰν ἑτέραν τινα λέγουσι νόσον τῷ ὀνόματι τούτῳ, τὴν ἐπιληπτικὴν οἶμαι· ἱερὰ δὲ αὕτη κυριώτερον ἂν κληθείη, διαφέρουσα πασῶν τῇ κακώσει· ἐπεὶ καὶ μέγα τὸ ἱερὸν τοῖς γλωσσηματικοῖς εἴθισται καλεῖσθαι. It is also indirectly supported by the analogous expressions ἱερὸν μένος Ἀλκινόοιο (Homer, *Odyss.*, lib. vii., v. 167), ἱερὸς ἰχθύς (see Athenæus, *Deipnosoph.*, lib. vii., § 17-20, pp. 282-4), and especially by the anatomical name ἱερὸν ὀστοῦν, 'os sacrum,' of which this seems to be the most probable interpretation. Cælius Aurelianus gives the following interpretations: 'Appellatur Epilepsia "*sacra* passio," sive quod divinitus putetur immissa; sive quod sacram contaminet animam [which is supported by Apuleius, *Apolog.*, p. 58, ed. Price]; sive quod in capite fiat, quod multorum philosophorum judicio sacrum templum est partis animæ in corpore natæ [which is the reason given by Theophanes Nonnus, *loco cit.*]; sive ob magnitudinem passionis, majora enim vulgus *sacra* vocavit.' (*De Morb. Chron.*, lib. i., cap. 4, p. 291, ed. Amman.) Of all the explanations that have been proposed, perhaps that which derives the term from the disease being supposed to be under the more immediate direction of the gods is the most likely to be the true one, both as being the most antient and also as being that which Galen preferred: it is also indirectly confirmed by two popular names mentioned by Leo in his 'Synopsis Medicinæ,' lib. ii., cap. 2 (ap. Ermerins, *Anecd. Med. Gr.*, Lugd. Bat., 8vo., 1840), viz. δαίμων and σεληνιασμός. If this is not the real meaning of the term, it must have been applied '*ob magnitudinem passionis*,' for none of the other derivations bear the slightest marks of probability.

SACHEVERELL, HENRY, D.D., was descended from a family which, according to Boyer ('Reign of Queen Anne,' p. 406), had in one of its branches made a considerable figure in Derbyshire. His grandfather, John Sacheverell, who had been educated for the church, joined the Puritans in the reign of Charles I., and, after the overthrow of episcopacy, officiated as Presbyterian minister at Wincaunton in Somersetshire; but, refusing to conform, was of course silenced at the Restoration, and, being afterwards apprehended at a conventicle, endured an imprisonment of three years, which is said to have occasioned his death. Joshua, his son by a first marriage, however grew up a zealous churchman, and died minister of St. Peter's church, Marlborough, leaving a widow, with a numerous family, in very poor circumstances. Henry, one of the sons, the subject of the present notice, who appears to have been born about 1672, was adopted by one Edward Hearst, an apothecary of the place, who was his godfather; and by Hearst's widow he was, after having attended the grammar-school of Marlborough, sent to Magdalen College, Oxford. At college Sacheverell was chamber-fellow with Addison, and they remained intimate friends till politics separated them thirty years after. To Sacheverell Addison inscribed in a very affectionate dedication his 'Farewell to the Muses,' written in 1694, when he intended to enter into holy orders. Sacheverell himself also cultivated both English and Latin poetry; several of his pieces in Latin verse (some ascribed to his pupils, but others with his own name affixed to them) are contained in the 'Musæ Anglicanæ,' and he is the author of a translation into rhyme of part of Virgil's 'First Georgic,' dedicated to Dryden, which is printed in the third volume of Nichols's 'Collection of Poems.'

Sacheverell became a fellow of his college, and appears to have been rather celebrated and successful as a college tutor. The Whig accounts of him indeed are full of stories to his disadvantage in this as in every other part of his career, but they have all the air of the inventions or exaggerations of party malice. Among other things it is asserted that he was refused ordination by Dr. Lloyd, bishop of Lichfield and Coventry (afterwards of Worcester), on the ground of his deficiency both in divinity and classical knowledge; but afterwards, it is added, he was, on the recommendation of the bishop of Oxford, admitted into holy orders by this same Lloyd, 'with particular marks of favour.' He took his degree of M.A. in 1696, of B.D. in 1707, and of D.D. in 1708. The first living he held was Cannock in Staffordshire, but in 1705 he was appointed preacher of St. Saviour's, Southwark; and it was while in this situation that he delivered his two famous sermons, the first at the assizes at Derby, on the 15th of August, 1709, the second before the lord-mayor at St. Paul's, on the 5th of November in the same year. These discourses, having been printed, were both in December following brought under the notice of the House of Commons, which passed a resolution denouncing them as 'malicious, scandalous, and seditious libels, highly reflecting upon her majesty and government, the late happy Revolution and the Protestant succession as by law established, and both houses of parliament, tending to alienate the affections of her majesty's good subjects, and to create jealousies and divisions among them.' The author and printer were at the same time ordered to attend at the bar of the House, which they did accordingly on the next day (14th December); and then, after he had admitted the authorship of the sermons, it was moved and carried that Sacheverell should be impeached of high crimes and misdemeanours. It is asserted by Swift and other authorities that Sacheverell's real offence, in the eye of the Whig ministry of the day, was his having in one of his two discourses pointed, as was conceived, at the lord-treasurer Godolphin, in a passage about 'the crafty insidiousness of such wiley Volpones.' Volpone seems to have been before this a popular nickname of Godolphin. After various preliminary proceedings, the trial commenced before the House of Lords in Westminster Hall on the 27th of February, 1710, and lasted till the 20th of March, on which day a majority of their lordships (69 to 52) pronounced Sacheverell guilty; and three days after, sentence was passed, adjudging him not to preach for three years ensuing, and ordering his two sermons to be burnt by the common hangman. The populace, who had espoused the cause of the accused, considering him, with the great majority of the clergy, as the champion of the church, celebrated this impotent conclusion of the affair with bonfires and other rejoicings both in London and all over the kingdom; and when, in May following, he set out to take possession of the living of Salatin in Shropshire, to which he had been presented, his journey to Oxford, and thence by Banbury, Warwick, and Wrexham to his preferment, was a continued triumph; which was prolonged as he returned to London through Shrewsbury, Bridgenorth, Ludlow, Worcester, and other towns. It is admitted on all hands that nothing had so much effect as this affair of Sacheverell's in influencing the general election which took place this same autumn, and the immediate consequence of which was the overthrow of Godolphin and his colleagues.

On the expiration of his sentence, in March, 1713, Sacheverell preached at St. Saviour's church, on the Christian triumph, or the duty of praying for our enemies, and again published his discourse. 'I have been reading Sacheverell's long dull sermon, which he sent me,' says his friend Swift, in his Journal to Stella, under date of 4th April; 'it is the first sermon since his suspension has expired, but not a word in it upon the occasion, except two or three remote hints.' In a preceding entry he mentions that Sacheverell himself had told him the bookseller had given him 100*l.* for the sermon, and intended to print 30,000. 'I belie[illegible] Swift, 'he will be confoundedly bit, and will hardly [illegible] half.' Of his St. Paul's sermon Burnet states th[illegible] 40,000 copies were supposed to have been printed [illegible] persed over the nation. The fever had now prob[illegible] what cooled; but the popular enthusiasm of wh[illegible] been the object, and which had produced such d[illegible] lic results, had necessarily made Sacheve[illegible] importance, at least for a short time longer. [illegible] after the removal of his suspension, the que[illegible] him to the valuable rectory of St. Andrew, [illegible] appears that he had interest enough with th[illegible] to procure also a handsome provision for [illegible] He had besides the good fortune to have a co[illegible] at Callow in Derbyshire left to him by his [illegible] Sacheverell, Esq. He never appeared [illegible] except in a dedication prefixed to a vol[illegible] sermons by the Rev. W. Adams, published in 171[illegible] is stated to have made some noise in the wo[illegible] by [illegible] rels and law-suits with his parishioners—a [illegible] which his system possibly required after hi[illegible] so remarkable a part in the greater field of [illegible] He was also suspected of being concerned [illegible] plot of his friend Atterbury, who is believed to have [illegible] the defence which he delivered on his impeac[illegible] whom, then in exile, he left a legacy of 5[illegible] which took place 5th June, 1724. (*State* [illegible] pp. 1-522; *Parliamentary History*, vol. vi., [illegible] Burnet's *History of his own Time*, ii. 537. [illegible] *History of the Reign of Queen Anne*, pp. 406, [illegible] *Continuation of Rapin*, vol. iv., pp. 149, &c.; [illegible] *nal*, *Four Last Years of the Queen*, and [illegible] Duchess of Marlborough's *Account of her Cond*[illegible] in Howell's *State Trials*, vol. xv., p. 14, i[illegible] 'There is a curious passage about Sacheve[illegible] "James II.," p. 184;' but Harris wrote no [illegible] II., nor can we find Sacheverell mentioned in [illegible] other Lives.)

SACHS, HANS, whose real name is said to b[illegible] Loutzdorffer, was the most eminent poet [illegible] Germany produced at the period of the Re[illegible] doctrines of which he became a convert, and ass[illegible] of Protestantism by his pen. This most prolific a[illegible] original and highly gifted writer, was born No[illegible] 1494, at Nürnberg, where his father was a tailor. [illegible] studying at the Latin schools, he was put to be [illegible] in the business of a shoemaker.

About two years after he entered his apprenti[illegible] that is, about the age of seventeen, Hans became the [illegible] of Leonard Nunnenbeck, a weaver by trade. [illegible] meistersinger [GERMANY, *Literature*, p. 194], [illegible] him into the mystery of weaving verses. A[illegible] apprenticeship expired, he set forth on [illegible] through Germany in his double capacity, [illegible] to visit those cities which were most re[illegible] poetical societies and corporations of singers. [illegible] finished his pilgrimage, he returned and settled [illegible] berg, where, in 1519, he married Kunegunda Kre[illegible] proved an excellent wife, and bore him five sons [illegible] daughters. She died in 1560 (after surviving all [illegible] and in the following year, when he was sixty-[illegible] married Barbara Harscher, which union proved [illegible] happy than the former one. His eyesight bec[illegible] paired, and his hearing still more so, he withd[illegible] society, and shut himself up with his books; his [illegible] serenity and cheerfulness of temper however were [illegible] turbed by these misfortunes. Thus tranquilly he [illegible] his 87th year, dying January 25, 1578.

If his literary character be estimated by the number of his productions, Hans Sachs was literally one of the greatest writers Germany has ever produced, for they amounted altogether to upwards of six thousand different compositions, of which only a portion are contained in the five folio volumes of his pieces printed at Nürnberg, 1576-79. He may therefore very well be paralleled to Lope de Vega; and considering that he had another business, the fertility of his pen is even more surprising than that of the Spaniard's. Such extraordinary writers however pay a double penalty: their productions are of necessity only extemporaneous effusions upon paper; and by far the greater bulk of them must be consigned to oblivion. By posterity they are known only as recorded literary phenomena: they preserve a name in the annals of poetry, and as much as that has been a[illegible] nplished by a single composition, such as the 'Elegy in a untry Churchyard,' and 'Julius von Tarent,'—productions it immortalise the names of a Gray and a Leisewitz. For student who is desirous of tracing the formation of the guage and literature of Germany, the works of Sachs sess considerable interest independent of their intrinsic rits, which however, to be fairly appreciated, must be sidered with reference to his own times and country. ey display great shrewdness, liveliness, and keenness of ire, together with a steady manliness of tone. But they frequently offend both modern taste and modern ideas lecorum. Their failing in that respect is the very reverse refined immorality. Nor is that by any means their sole ect; for, as might indeed be expected, they are overlaid h a great deal of mere garrulous prosing, unrelieved by charm of versification. Another great fault is, that all subjects are too much in the same strain, stamped by same manner; wherefore it has been remarked, that or three of his pieces serve to render us acquainted h the whole. Yet it is easier to point out faults and perfections of the kind above mentioned, than to estimate h a writer critically. After observing that Goethe has tated Hans Sachs in his 'Faust,' his character is thus ned up in the 'Retrospective Review:' 'If three requi- ire to be looked for in poetry—invention, expression, enthusiasm,—we shall find all these blended in Sachs. is an inventor of forms and of things: his allegories are ly, poetical, fresh, and brilliant; his expression rich; language choice (?), harmonious (?), and teeming with phraseologies full of character and point and beauty. t what especially enhances the interest of his composi- ns, is the fidelity of colouring with which he exhibits the racters and times which he paints.' This last remark t be taken with great limitation, and with reference only ue manners of his own age, for his anachronisms against tory, costume, and probability are frequently quite ling—Semiramis and Cleopatra, Agrippina and Clyestra, appear together in the same piece. In fact, rding to his own confession, he was acquainted with ther Greek nor Latin, and knew the works of the an- nts only through such translations as were then to be cured. Yet, though excluded from the learned lan- ges, his reading was remarkably extensive. After all, atever imperfections criticism may allege against the er, biography has none to record against the man, save se which are common to human nature. He uniformly loyed his pen with the best of motives—to reform and in- ruct; and not only was his personal character irre- chable, but the amiable *bonhommie* of his disposition h as to obtain for him the appellation of 'Honest Hans hs.'

ACHTLEVEN (or ZACHTLEVEN), CORNELIUS, born at Rotterdam, in 1606. It is not known under master he studied, but it is apparent that he was a ul observer of nature. He settled at Antwerp, and ned great reputation by painting subjects from low life imitation of Brauwer. His corps-de-garde are much ised for their judicious grouping and truth to nature. painted also the interiors of farmhouses, and the sports recreations of the villagers, in the style and manner of Teniers. Though much inferior to the two great artists om he chose for his models, his works have considerable rit, and are found in the best collections.

ACHTLEVEN, HERMAN, was born at Rotterdam, 1609, and studied under John van Goyen. He did not rever confine himself to the style of his master, but ap- ed with the greatest diligence to the study of nature, king numerous sketches and designs, which are highly eemed by the curious. The scenery of the Netherlands being suitable to his taste, he visited the countries on banks of the Rhine and the Meuse, which afforded him re picturesque subjects. Some writers have affirmed it he visited Italy, but the Dutch biographers appear to re proved that he never travelled farther from home to the countries above mentioned. His pictures are uly finished, with a light free touch, and a skilful management of the aerial perspective. He generally intro- ces into his landscapes a great number of figures and ts, which are drawn with great correctness and spirit. skies and distances are in general clear, and he often deavours to express the effects of the vapour between the e and remote objects, like Berghem and Wouvermans. is merit was justly appreciated by his contemporaries, and his best pictures, which are not common, are still highly esteemed. He died in 1685, at the age of 76.

SACK, a Spanish wine of the dry kind; in French, *Vin sec*. It is called *seck* in an article, cited by bishop Percy, from an old account-book of the city of Worcester: 'Anno Eliz. xxxiiij°. Item, for a gallon of claret wine and *seck*, and a pound of sugar.' Other instances have been found. See the various notes on the two parts of Shakspere's 'Henry IV.' It is the same wine which is now named Sherry.

Falstaff calls it *Sherris sack*, that is, sack from Xeres in Spain. Blount, in his 'Glossographia,' describes it thus 'Sherry sack, so called from Xeres, a sea-town of Corduba in Spain, where that kind of *sack* is made.' Ritson pretended that the old sack of Falstaff's time was a compound of sherry, cider, and sugar, but he produced no good authority for the assertion. The chief difficulty about sack has arisen from the later importation of sweet wines from Malaga, the Canaries, &c., which were at first called Malaga or Canary sacks; sack being by that time considered as a name applicable to all sweet wines. Sweet wines were not so early imported. Howell says, in his 'Londinopolis,' p. 102, 'I read in the reign of Henry VII., that no sweet wines were brought into this realm but Malmsyes;' and soon after (p. 103), 'Moreover no sacks were sold but Rumney, and that for medicine more than for drink; but now many kinds of sacks are known and used.'

One of these sweet wines still retains the name of sack. It is little used, but being proverbial for sweetness, it has caused some misunderstanding as to the original dry sack. Falstaff says, 'A good Sherris sack has a two-fold operation in it.' (2 *Henry IV.*, iv. 1.) Presently he calls it Sherris only; and soon after both names are used indiscriminately. The drinking of it with sugar was not peculiar to Falstaff. The same beverage occurs in the 'Wild-goose Chace' of Beaumont and Fletcher, act v., sc. 2. It is said also of a personage, in the 'Miseries of Inforced Marriage,' that 'he lies fatting himself with sack and sugar in the house, while his brothers are fain to walke with lean purses abroad.'

If further proof were wanting that Falstaff's sack was not a sweet wine, but was actually Sherry, it is abundantly furnished by Dr. Venner's work, entitled 'Via recta ad Vitam longam,' published in 1637. After discussing medicinally the propriety of mixing sugar with sack, he adds, 'but what I have spoken of mixing sugar with sack must be understood of Sherie sack; for to mix sugar with other wines that in a common appellation are called sack, and are sweeter in taste, makes it unpleasant to the palate and fulsome to the stomach.'

But the derivation of sack from *sec* may not be quite certain. Douce, in his 'Illustrations of Shakspere,' says, 'Ponet's "Treatise of Politike Power," 1556, 12mo., and Cotgrave, in his Dictionary, make sack to be *vin sec*.' This plausible etymology might have been wholly relied on if an ingenious female traveller, in speaking of the Tartar *Koumis*, a preparation of mare's milk, had not informed us that she should not choose to partake of it out of the goat-skin *sacks* in which it is carried, 'as the Spaniards,' says she, 'do their wine; which by the by is a practice so common in Spain as to give the name of sack to a species of sweet wine once highly prized in Great Britain.'

(Guthrie's *Tour through the Crimea*, 1802, 4to., p. 229; Nares's *Glossary*, *v.* 'Sack;' Douce's *Illustr. of Shakspere*, vol. i., p. 417.)

SACKATOO. [SOODAN.]

SACKET'S HARBOUR. [NEW YORK.]

SACKVILLE, THOMAS, EARL OF DORSET, was born in the year 1536, at Buckhurst in Sussex. He was the only son of Sir Richard Sackville, the representative of a very antient family, who had been high in office under Edward VI., Mary, and Elizabeth. After studying some time both at Oxford and Cambridge, and taking the degree of M.A. in the latter university, he removed to the Inner Temple, and was called to the bar. Shortly afterwards he was elected a member of the House of Commons. His youth, though passed in dissipation and extravagance, was not wholly mispent, as is shown by his poems, which were written at an early period of life, and were the first fruits of his vigorous and fertile mind. At the time of his father's death, in 1566, he returned from the Continent, which he had visited after his marriage. In the same year he was created Lord Buckhurst by Elizabeth, and having on a sudden reformed his habits of profuseness, received from that time various marks of royal favour. In 1570 he was sent on an embassy to France, to treat of the marriage then proposed between the queen and the duke of Anjou; and in 1587 was employed as ambassador extraordinary to the United States of the Netherlands, to adjust the differences between them and the earl of Leicester, whose anger he drew upon himself in the discharge of this duty, and was in consequence imprisoned till the death of his formidable enemy in 1588, after which event he was at once restored to Elizabeth's confidence, and filled a variety of state offices. In 1598, on the death of Burghley, he was made lord treasurer, which situation he held during the next reign till his death, April 19, 1608, having, with rare good fortune, had his great services fully appreciated by two royal personages of very different character. His letters, many of which are preserved in the Cotton collection in the British Museum, show that he was distinguished by the qualities which befit a statesman, and they confirm the judgment of his contemporaries.

His poems are—the tragedy of 'Ferrex and Porrex,' called in a later edition 'Gorboduc;' 'The Induction,' or poetical preface to 'The Mirror for Magistrates;' together with 'The Complaint of the Duke of Buckingham,' in the same collection. Of these 'The Induction' possesses great merit, and reminds us of the poems of Spencer, to which, though inferior in richness of imagery, it bears great resemblance, not only in the curious exactness with which the lively portraiture of allegorical personages is made out, but in the language and metre. The earnestness and quaintness of antiquated forms of speech, and the stately structure of the verse, contribute much in the compositions of both poets to the solemn effect of the pictures which are presented in succession to the reader. Warton, in his 'History of English Poetry,' considers Dorset to have furnished the model upon which Spencer formed his style. For some further information, see Wood's *Athenæ Oxonienses* (Bliss).

SACKVILLE, CHARLES, EARL OF DORSET, was born January 24, 1637. In his youth he travelled into Italy, and returned a little before the Restoration; he afterwards sat in parliament for the borough of East Grinstead in Sussex. Being, like most young nobleman of his day, of a dissolute turn, he engaged in no public employment, and he became a great favourite with Charles II. In 1665, being then Lord Buckhurst, he attended the duke of York as a volunteer in the Dutch war; and on the eve of the battle in which the enemy were defeated, and Opdam, their admiral, killed, he is said to have composed the celebrated song beginning 'To all ye ladies now on land.' He was employed after this in short embassies to France. Having become earl of Dorset by the death of his father, 1677, he soon after chose for his second wife a daughter of the earl of Northampton.

Dorset was favourably noticed by James II., but ceased to be one of his adherents as he grew more violent in his measures. After the king's departure, he sat with other peers in council to preserve the public peace. At the accession of William III. he was appointed lord-chamberlain of the household, and received other marks of royal favour. His health after this declined, and he died at Bath, January 19, 1705-6. A rare felicity, both in speech and action, seems to have distinguished Dorset above all his contemporaries. This is admitted by those of his brother courtiers who were themselves most remarkable for wit and address. Something of the ease and sprightliness of his conversation has been transmitted to us through his poems, though there is little to justify the extravagant praises of Dryden and others, these compositions being few in number and on trifling subjects. They are printed among the minor poets. An elaborate panegyric by Prior, and a biography by Johnson, abridged from a longer one by Cibber, may be consulted for his life. See also Walpole's 'Royal and Noble Authors' (Park).

SACKVILLE, LORD GEORGE, a younger son of the ducal house of Dorset, was born January 26, 1716. During the reign of George II. he was actively engaged both as a statesman and a politician: he served at Dettingen and Fontenoy, and at the battle of Minden, fought in 1759, he commanded the British forces under Prince Ferdinand of Brunswick. To this he owes the greater part of his notoriety: having failed to execute the prince's orders to charge, by which default the victory was rendered less decisive than it might have been, he was insulted by his commander, and, at his own request, recalled to England, where he demanded, and with some difficulty obtained, a court-martial, by which, April 3, 1760, he was adjudged incapable of serving thereafter in any military capacity. George II., who was incensed at Sackville's conduct, took every means [illegible] dering his punishment most galling; and among [illegible] things, erased with his own hand, in council, Lord [illegible] Sackville's name from the list of privy-councillors. [illegible] reign of George III., to whom he was personally acce[illegible] he returned to public life; and having attached h[illegible] Lord North, was made secretary of state for the co[illegible] 1775, and had the direction of the American [illegible] was what success need not be here said. In 1782, [illegible] with his leader, retired from office, having just before been raised to the peerage by the titles of Viscount Sackville and Baron of Bolebrook, titles united to the dukedom of Dorset by the accession of Lord George's eldest son to that superior dignity. In 1770 Lord George Sackville took the name of Germain, for an inheritance, under which name he is equally well known. He died August 26, 1785.

Two explanations may be found of his misconduct at Minden: one, lack of personal courage, of which he had before been suspected; the other, personal pique against Prince Ferdinand, indisposing him to act with vigour. The latter is hardly more creditable than the former. It is to be added however that some inconsistency seems to have existed in the orders delivered to him, which may have given rise to hesitation in a man unequal to the emergency, without gross cowardice or wilful and predetermined betrayal of trust.

SACRAMENTS and TRANSUBSTANTIATION. 'No religion,' wrote Barrow of the Christian, in the nervous language of the time, 'can be purer from superstitious alloys or freer from useless incumbrances than is this; the ritual observances it enjoineth being as very few in number, in nature simple, and easy to observe, so evidently reasonable, very decent, and very useful, able to instruct us in, apt to excite us to the practice of our wholesome duties.' Most religious denominations will agree in [illegible] of these remarks, although, as in the case of t[illegible] of justification (the corner-stone of *individual* Christianity), various shades of interpretation have obtained currency; so, with regard to the particulars of the Sacraments (the entrance and centre of Christian fellowship), the greatest diversity of opinion prevails.

The Christian Sacraments are not merely certain [illegible] forms, but the highest acts of church membership. For [illegible] Christian church being but the outward visible representation of the internal fellowship of the faithful with Christ and with one another; this twofold element of the ch[illegible] is most fitly corresponded to by the institution of [illegible] visible actions, intended to express an in[illegible] effect or grace. Such are the Sacraments, a [illegible] and is express 'Sacramentum,' by which the Greek [illegible] rendered in the old Italic versions, and [illegible] Vulgate.

With regard to the number of the Sacraments, as is [illegible] known, two opinions are current among Christian [illegible] nities,—the Greek and Romish churches holding the [illegible] ber of seven, while all other Catholic bodies limit the [illegible] ber to two. The history of this difference may be [illegible] as follows. The term Sacrament was applied by the [illegible] the mysterious doctrines of religion, as the Trinity, [illegible] carnation, and, in some instances, to the ordinan[illegible] ligion in a wide sense. In a certain sense the seven[illegible] system of the church of Rome may be considered [illegible] abatement of the lax terminology of some of the F[illegible] The title of Sacraments is by her limited to seven act[illegible] baptism, or the sign of our spiritual birth; the e[illegible] in which our spiritual life is nourished; co[illegible] on, for the strengthening of the same; penance, for the restoration of the lapsed; extreme unction, as a preparation for death; matrimony, for maintenance of the race of mankind in general; and orders, for that of the race of God's ministers.

Without entering into the controversy on this subject, [illegible] will be sufficient to observe that the number of seven, as asserted by the church of Rome, is very far from being sanctioned by the uniform assent of ecclesiastical practice. Antecedently to a very modern synod (that of Florence) the number of seven had never been positively settled.

The two sacraments then, to which, in the judgment of all Catholic bodies (save the Greek and Romish c[illegible] number is properly limited, are those of baptism ord's supper. It is asserted that on the basis of th rites of recognised typical import our Lord l, by direct command, those two sacraments, of ne the authority is unquestionable. An indirect in favour of this more restricted view may be n the Romanist statements respecting the relative ne several sacraments. For although the autho- at church are consistently anxious to prove the nber of seven to be equal in rank, the dignity y directly attribute to the eucharist, and that y cannot withhold from baptism, may be in some d as an involuntary assent to the doctrine of the arty.

ncipal feature of the scheme of salvation provi- ffered to man is faith in the Saviour; that is, gh Christ a path is opened to heaven. The eye ristian faith is not confined exclusively to the or the person, or the sufferings and death of it it comprises within its range the entire system. in a perfect devotion to Jesus; in an internal n him, and spiritual imitation of him, in which rs as a new creature, both as regards knowledge, d action. The symbols of this faith, and the acts an obligation to it is expressed, are the two acraments, baptism and the Lord's supper.

he other sacrament, that of baptism is based on a stom. An examination of the antiquities and hat people establishes this fact to an extent lly known. Baptism denotes the admission of a e on Christ, and an entrance into fellowship with sequently, an appropriation of all that Christ on believers. By baptism is expressed the two- on of man,—to his previous condition, which he —and the new one on which he enters; to his eath with Christ, in that he appropriates by faith ' redemption, which was completed by His death; rising again to walk in newness of life through s resurrection, the pledge of his own future one. fellowship with Christ, as the Son of God, re- filial relation of man to the Father, and a par- in the Spirit imparted by Christ. Christ is the ne true spiritual baptism, of which that by water only; and this adoption into the divine Spirit the difference between the Christian baptism ptism of John.

gard to the effects produced by baptism, no dog- those of grace and justification, have perhaps oductive of disputes as this of baptismal regene- the kindred subject of infant baptism. The eld by the church of England, that of Rome, and an, do not differ in material particulars; while ner religious denominations will be found to vary neasure with their leading principles) from what known as the Catholic doctrine.

nnonites, whose doctrinal statements on this head nsidered as the most systematic of the various of the anti-pædobaptist family, define baptism by which a party, being of mature judgment, is n the name of the Father, Son, and Spirit, into the Church, and, in proportion to the sincerity of his and the heartiness of his faith, is renewed in- d guided into newness of life.

Socinus, in his epistles, speaks of baptism as an matter, destitute alike of perpetual obligation ne original warrant of Christ or his Apostles. vian Catechism, after limiting the ceremonial f Jesus to the single one of the Lord's supper, vehement error' to attach any power of regene- aptism. This it considers as a simple external of belief in Christ, to be made by adult converts nenism or Judaism.

n difference upon this point between the tenets cinians and of the Remonstrants or Arminians be comprised in the extension (by the latter) of infants, but as a matter of private opinion. The of baptism by the followers of Schwenkfeld, and tly by the body of Friends, as an external, carnal , is perfectly in accordance with the spiritualism cts.

ordance of the Lutheran church and that of Rome acrament of baptism being admitted in the main, on sufficient authority that the church of England has in this matter 'simply adopted those theological terms which through all ages of the Catholic church had been understood in the same unvaried meaning;' and further, which are held by the church of Rome in a meaning equivalent to that of the teachers by whom the church of England was restored.

It is an indisputable fact that in the authoritative formularies of the church of England the doctrine of baptismal regeneration is throughout asserted or implied. By baptism, when rightly received, 'the soul is admitted to the benefits of Christ's atonement,' and (to quote further from the same writer) 'is considered to be rightly received, when there is no positive obstacle or hindrance to the reception.' The admission of the first of these positions—simply, and as revealed in Scripture—would have obviated much unprofitable controversy. Leaving the first question on this footing, the second, as to the efficacy of baptism in cases where no positive obstacle or hindrance is opposed to the reception (which includes the case of infants), is answered in the affirmative by the Anglican, as by all Catholic branches of the Christian church. 'He which with imposition of hands and prayer did so great works of mercy for restoration of bodily health, was worthily judged as able to effect the infusion of heavenly grace into them whose age was not yet depraved with that malice which might be supposed a bar to the goodness of God towards them.' If these words of Hooker be coupled with the declaration of Christ, that, so far from destroying the law, he came to give it in all essentials a new and spiritual extension; that on all great occasions he built on a Jewish foundation; that the other sacrament was founded on the passover; that the Christian church was derived from the Synagogue: if all this be united with his declarations concerning infants, and his kingdom, and the entrance therein—it must be confessed that either our Lord declared infants capable of inheriting what they never could attain to, or that having so declared, he willed them to be qualified by a Christian adaptation of a rite already familiar. 'As for baptism of infants,' writes Archbishop Usher, 'it is sufficiently warranted by reasons of Scripture, though not by example.' So thought the apostles, and so likewise the early Christians. That infant baptism, from the time of the apostles, was ordinarily practised in the church, rests on very valid proof. In support of this, Origen, Cyprian, and Tertullian may be fairly quoted.

II. The various opinions respecting the exact import and appropriate benefits of the Lord's supper are of high antiquity. The difficulties connected with the question are increased by the general adherence to the words of Scripture, observable in the liturgical formularies. The non-existence of a dogmatical theology during the first ages of the church is well known, which renders it unnecessary to look for exact scientific definitions throughout that period. But, concurrently with the uniformity of practice above adverted to, there is to be found a threefold variety of interpretation, corresponding with the peculiar views of what may be considered the three principal schools of early Christian theology.

The church of Asia Minor, as also some great Origenists in the West, professed views of the holy eucharist which the church of Rome and the Lutheran have (to a certain extent) pleaded as the sentiments of antiquity supporting their own. Such were those of Ignatius, Justin Martyr, Irenæus, Hilary of Poitiers, Cyril of Jerusalem, Gregory of Nyssa, Ambrose, Chrysostom, and Theodoret. The common point of agreement among these writers is the communion of the body and blood of Christ in a high spiritual sense *generally*. But a considerable difference of statement regarding details is observable among them. For example, some expressions of Cyril of Jerusalem are directly and strongly opposed to the tenet of transubstantiation, which Gregory of Nyssa is not unfairly quoted as supporting.

The views of the church of North Africa, as expressed by Tertullian, Cyprian, and Augustine, differed as a whole from those just named. The African doctors may be considered as regarding the eucharist as an active and efficacious symbol.

A third party, that of the school of Alexandria, applied in some measure its usual allegorising views to this sacrament. But even in the absence of all approach on the part of these Fathers to corporeal views, a leaning to the sentiments of the first-mentioned party is observable in some portions of their writings.

Each of the many designations by which this sacrament was known until the close of the fourth century, bore some reference to the original object of its institution. This may be traced throughout the various expressions—breaking of bread, communion, Lord's supper, eucharist, oblation, commemoration, and passover. Ecclesiastical antiquity cannot be adduced with fairness in support of the literal interpretation applied by a large body of Christians to the words used by our Lord in his institution of this sacrament. John of Damascus, the principal writer of the Eastern church, maintained (it is true), on the authority of some of the Fathers, a literal change of the bread and wine into the body and blood of Christ. The figurative interpretation put upon the words of Christ by a council at Constantinople in A.D. 754, was denied at the second council of Nice in 787, when it was ruled that the sacred symbols are not figures or images at all, but the real body and blood. Theophylact and Euthymius Zigabenus coincide with John of Damascus. But it was reserved for the Western church to carry out into its remote consequences the doctrine of a material change, which, in common with her Eastern sister, she ultimately came to maintain. Great discrepancy of expression on this subject may be found in the writings of Western theologians anterior to the time of Charlemagne; the utmost however that can be fairly drawn from them is that the sacramental elements were not to be regarded as purely symbolical. But it is undeniable that a strong tendency to transubstantiation (as it was afterwards termed) is throughout discernible. This doctrine was maintained during the ninth century by Paschasius Radbert more precisely and authoritatively than before. He was opposed however by Rabanus Maurus, and Ratramn or Bertram (whose sounder and more scriptural views many centuries later found an echo in our own Ridley), and also by the suspected ingenuity of Scotus Erigena.

Various instances of opposition to the doctrine of transubstantiation subsequently occurred; but, supported by authority like that of Sylvester II. (the famous Gerbert), it continued to gain ground. During the eleventh century it had become an article, to dissent from which was heretical; although a doctrine substantially the same with that held by the Anglican church at the present day was preached by doctors such as Alfric, and although an archbishop of Sens, Leutheric, advocated opinions regarding the eucharist similar to those which involved Berengar of Tours in controversy with Lanfranc, and drew upon him the hostility and condemnation of popes and councils.

In this condition the dogma of transubstantiation passed into the hands of the schoolmen, whose marvellous ingenuity was devoted to establishing and explaining what became the centre and support of the theurgic pretensions of the hierarchy of the middle ages. The term transubstantiation was probably introduced into the ecclesiastical vocabulary by Hildebert of Tours. The dialectic talents of Lombard, Alexander Hales, Albert, and Aquinas were vigorously employed on this subject. It was invested with legal authority by Gratian. Finally, the doctrine was established as matter of faith at the Lateran Council in 1215. Even Occam assented to its truth, and it was subsequently ratified at Trent. Among the numerous controversies connected with the different theories on the subject, the more modern opinions are marked by a tendency to regard the eucharist as a purely symbolical rite. For transubstantiation Luther substituted (probably through the effect of Occam's writings) a corporal local presence, commonly called consubstantiation. There appears an inconsistency in the obstinacy with which Luther contended for his theory. He had abandoned the sacrifice of the mass and the theurgic pretensions connected with the real presence which made this dogma of such importance to the church of Rome. Luther's great object was to preserve this sacrament from being degraded by the same unspiritual *subjective* views (as he conceived) with which it was menaced by Carlstadt and his party. This evil would be best remedied by a bold assertion of the *objective* dignity of this sacrament, divested of the superstitious additions with which it was encumbered in the church of Rome. Hence the Lutheran doctrine of the eucharist. What has been said will suffice to show how ungrounded is the charge sometimes brought against Luther—that he threw away the substance while he retained the shell. But his tenacious adherence to scholasticism in this respect contrasts strangely with his uncompromising hostility to that philosophy respecting the fundamental dogma of justification by faith. Zwingli, on the other hand, together with a corporeal and local presence, rejected all notion of a spiritual presence and graces. But the opinions of Calvin shortly afterwards superseded the colder ones of Zwingli, many of whose followers, to quote from Waterland, abandoned the 'notion of naked signs and figures to the Anabaptists of those times, where they rested, till again revived by the Socinians, who afterwards handed them down to the Remonstrants.'

The point of divergence between the adherents of Luther and Calvin respecting the eucharist may be stated thus. The former party held, according to the earlier Augsburg Confession and the Form of Concord, that the body of Christ was contained in, with, and under the sacramental bread. The others held the doctrine only of a real spiritual feeding on the body of Christ, which took place in the faithful contemporaneously with the reception of the outward elements. In the opinion of Waterland, 'Calvin refined upon Zwingli's scheme, steering a kind of middle course between the extremes. He appears to have set out right, taking his ground with good judgment; and had he but built as carefully upon it afterwards, no fault could have been justly found.'

The late Bishop Lloyd considered that the
trine was borrowed from that of Calvin.
fourth clauses of the twenty-eighth article
manner and means after and by which the
is taken in that sacrament, would seem [illegible]
view. But the words of Waterland may be
as expressing briefly the opinion held by
Anglican teachers on this subject: 'Our [illegible]
came after Calvin had some advantage in point
and a greater still in the rule or method wh
pitched upon as most proper to proceed by.
of all is, that sacramental or symbolical feed
eucharist is feeding upon the body brok
shed under the signs and symbols of bread and wine.
result of such feeding is the strengthening or
our mystical union with the body glorified, and
speaking, we feed upon the body as dead, and we [illegible]
into closer union as living, and both in the euch
duly celebrated.'

SACRED WAR. [PHILIP, p. 74; PHOCIS.]

SACRIFICE, an offering made to God, in
thing offered is wholly or partially destroyed. It is
rally supposed that sacrifices were instituted
after the fall of Adam, when God made with
called 'the covenant of grace;' and that on th
sacrifice was partly an atonement for Ad
ratification of the covenant. This supposit
the fact that God clad Adam and Eve with
beasts; and since animal food had not yet b
man, it is thought that these beasts must have b
sacrifices. (*Genesis*, chap. iii.) In the next
meet with sacrifices as a divine appointment. [illegible]
All over the world sacrifices have been fo in
or other, which is another proof of th as
Their chief object is to atone for sin
they have also been offered as the
favour and assistance of God, and of
and gratitude to him. They may be divided
bloody and unbloody. In the heathen wo
fices have been very generally prevalent,
notion that human life is the most preci
be offered to the divine Being. Sacrifices
of the Jewish law. [MOSES.] Christians
be abolished since the death of Christ, since,
in his Epistle to the Hebrews, that was the one g
fice which has for ever made atonement for the si

Valuable remarks on this subject will be found
writings of most eminent theologians; but
are too numerous to be referred to here. See
article 'Sacrifice,' in Charles Taylor's edition
Dictionary to the Bible.

SACRILEGE is 'the felonious taking of any
of any parish-church or other church or chapel
common law it was a capital offence, tho
seems to have been entitled to the benefit
discretion of the ordinary. But even if it were
able at the common law, yet the statute 25 Edw. III.
'De Clero,' comprehended this as well as other crimes, and gave 'the privilege of holy church to all manner of clerks, as well secular as religious.' Afterwards, by the statutes of 23 Hen. VIII., c. 1, and 25 Hen. VIII., c. 3, revived by

5 and 6 Edw. VI., c. 10, all persons not in holy orders were excluded from the benefit of clergy who on an indictment for *robbing* any church, chapel, or other holy place were convicted, stood mute, or peremptorily challenged more than twenty of the jurors: and by 3 and 4 W. & M., c. 9, the same consequences followed upon their outlawry. It seems however that no sacrilege came within these statutes which was not accompanied by an actual *breaking* of a &c. But by 1 Edw. VI., c. 12, all persons in general re deprived of their clergy for the felonious taking of any ods out of any parish-church or other church or chapel ll cases, except that of challenging more than twenty: by 3 and 4 W. & M., c. 9, upon such a challenging, as well as upon a conviction, &c. upon an indictment, whether the same county wherein the sacrilege was committed, r in a different one. It seems that sacrilege was the only elony at common law which deprived the offender of the ilege of sanctuary.

The present state of the law of sacrilege depends on the tute 7 and 8 Geo. IV., c. 29, s. 10, which enacts that 'if ny person shall break and enter any church or chapel, and teal therein any chattel, or having stolen any chattel in ny church or chapel, shall break out of the same, every h offender, being convicted thereof, shall suffer death as lon.'

9 Geo. IV., c. 55, s. 10, the same protection was ex- ed to meeting-houses and all places of divine worship. tute 5 and 6 Will. IV., c. 81, the punishment of eath was abolished, and transportation for life or for any erm not less than seven years, or imprisonment with or ithout hard labour for any term not exceeding four years, s substituted in its place. These penalties were again ered by 6 Will. IV., c. 4, which limited the term of im- nment to three years, and gave to the court a discre- uary power of awarding any period of solitary confine- nt during such term. But now, by the statute 7 Will. v., and 1 Vic., c. 90, s. 5, no offender may be kept in soli- ry confinement for more than one month at a time, or hree months in the space of one year.

SACRO-BOSCO, JOHANNES DE, an eminent Eng- sh mathematician of the thirteenth century, contemporary ith Roger Bacon. The place of his birth is generally supposed to have been Holywood, but is not positively known, here having been at that period at least two towns in ngland of that name. According to Mackenzie, who has imed him for a native of Scotland without any satisfac- ry evidence, he was admitted a member of the university f Paris in the year 1221, where he afterwards greatly dis- ished himself as professor of mathematics. All the aphers agree in asserting that he spent the greater of his life at Paris, and it is equally certain that he some few years at Oxford, where he is said by Whet- stede to have lectured before large audiences with applause. He died at Paris in the year 1256, as pears from the inscription on his monument in the clois- of the Mathurine convent at that place. As an author, is more distinguished by a few elementary works which left behind him, and which obtained a most extended pularity, than for much originality of talent. His treatise De Sphæra Mundi,' which is merely a paraphrased transla- on of a portion of Ptolemy's 'Almagest,' continued to be d in the schools for nearly four centuries; it was printed the first time in the year 1472, passed through more n twenty editions, and was commented on by several ate astronomers. In 1244 he composed a tract, 'De uto Ecclesiastico,' which contains the common rules t science; a curious colophon, which Wallis and Vos- ive from old MS. copies, is our authority for the date nposition. Perhaps however his most popular work t 'De Algorismo,' one of the earliest known works thmetic in which the Arabic numerical notation is loyed. This latter work, which is very common in nscript, has been recently printed in Halliwell's 'Rara hematica,' p. 1-26, and a nearly contemporary English slation of it is preserved in manuscript in the Ashmo- library at Oxford.

ACRUM, OS (ἱερὸν ὀστοῦν), a name used by some of e antient medical writers in a larger sense than that which w attached to it. Galen himself sometimes means to ate by this term the *os coccygis* as well as what is now the *os sacrum* (See 'De Usu Part. Corp. Hum.,' lib. , cap. 12); in other passages he restricts its meaning to e modern signification, as do also Rufus Ephesius ('De Corp. Hum. Part. Appellat.,' p. 52, ed Clinch.) and Julius Pollux ('Onomast.,' lib. ii., cap. 4, § 182). The origin of the name is doubtful; some suppose it to have been given 'quòd in eo aliquid sacri arcanique insit, quoniam partûs tempore divinitus aperiatur, eductoque fœtu solidescat miro quodam naturæ opificio' (J. Gorræi 'Definit. Med.'); others again, 'quòd partes quæ huic ossi adjacent diis offerri in sacrificiis solerent, id quod Menandri testimonio confirmant, οἱ δὲ τὴν ὀσφὺν ἄκραν θύσαντες. Etymol. Magn. *in voce.*' (Ibid.) The most probable derivation however appears to be from the sense of *greatness* sometimes signified by the word ἱερὸς, which is perhaps also the meaning of the name *Sacer Morbus.* [SACER MORBUS, and the authorities there given.] It seems to have been called by various names by the old anatomists, viz. πλατὺ ὀστοῦν (Galen, 'De Usu Part. Corp. Hum., lib. xii., cap. 12, p. 50, &c.), ὑποσπόνδυλον ('Anonymi Isag Anat.,' cap. 35), τρητὸς κόκκυξ (Jul. Pollux, *loco cit.*) &c., and perhaps the first of these rather confirms the opinion that the epithet ἱερὸν, *sacrum*, also was applied to the bone in consequence of its size.

SACY, ANTOINE ISAAC SILVESTRE DE, was born at Paris, 21st Sept., 1758. His father Jacques Abraham Silvestre practised as a notary in that capital. At the early age of seven De Sacy lost his father, but his mother took great care of his education, which, owing to the delicate state of his health, was directed by a tutor under his maternal roof. His progress in classical studies was very rapid, as appears from his intimate acquaintance both with Latin and Greek literature. At the age of twelve he became acquainted with Dom Berthereau, a Benedictine of St. Germain-des-Prés, who was then engaged in preparing a collection of such Arabian historians as have written on the Crusades, and who inspired him with a taste for Oriental languages. Having finished his classical studies, De Sacy began the study of Hebrew. From Hebrew he proceeded to the Syriac, Chaldee, and Samaritan, and thence to Arabic and Ethiopic. With these laborious pursuits De Sacy combined the study of the Italian, Spanish, English, and German languages, with all which he made himself well acquainted. He soon added to his knowledge of Arabic that of Persian and Turkish, two languages which, being then very little known in Europe, required new investigations on his part. De Sacy's first literary labours were directed towards biblical researches. In 1780, at the age of twenty-three, he undertook the examination of a Syriac MS. in the Bibliothèque Royale, which contained a translation of the Fourth Book of Kings, and he made some notes on the subject which appeared in Eichhorn's 'Biblical and Oriental Repertory' (Leyden, vol. vii., p. 227, et seq.). In 1785 he was elected a titular member of the Academy of Inscriptions and Belles-Lettres. Immediately upon his appointment he wrote two memoirs, one upon the breaking of the dike of Irem in Arabia Felix, the other on the original vestiges of Arabian literature (*Recueil de l'Acad. des Inscriptions*, vol. xlviii., old series; vol. x., new series). In the same year De Sacy was nominated a member of a committee of the Academy which was appointed to make analyses and extracts from the most important inedited works in the Royal Library; and there is scarcely a volume of the collection entitled *Notices et Extraits*, &c. which does not contain some notice by him of a Persian or Arabic work. Among his contributions the most remarkable are his 'Biographies of Persian Poets' (vol. iv.), and a notice on four Arabic works relative to the conquest of Yemen by the Othomans in the sixteenth century (vol. iv.). Shortly after he wrote his admirable Memoirs on various antiquities of Persia, and deciphered the Pehlvi inscriptions of Nakshi-Rostem, near the ruins of the antient Persepolis. He also gave the various readings on the medals of the Sassanian kings, together with an abstract of their history translated from Mirkhond. The whole was published in 1793, in one vol. 4to. During the revolutionary period De Sacy withdrew with his family to a small country-house some leagues from Paris, and devoted himself entirely to the study of Oriental literature. Among his labours at that time are his 'Researches into the Religious Tenets and Customs of the Druses,' which however were not published till shortly before his death. In 1795 a school for teaching living Oriental languages being instituted by a decree of the Convention, De Sacy was appointed Professor of Arabic. He then gave all his attention to the composition of an Arabic grammar, which he compiled chiefly from the works of native grammarians; and about the same time (1799) he pub lished his 'Principles of General Grammar,' of which a third edition appeared in 1815, Paris, 12mo. In 1805 De Sacy was sent by the Imperial government to Genoa for the purpose of examining certain Arabic manuscripts which were said to exist in the archives of the city; and on his return to Paris in 1806 he made a report to the Academy on the historical documents which he had found there. In the same year De Sacy was appointed Professor of Persian, and he published his 'Chrestomathie Arabe,' or a selection of extracts from various Arabian writers, both in prose and verse, by far the most valuable work for the use of students that has yet appeared. In 1810 his Arabic Grammar, the fruit of fifteen years' almost incessant labour, was published, as well as his translation of Abd-al-latif's account of Egypt (*Relation de l'Egypt*, &c., 4to., 1810). About the same time he published a 'Memoir on the Orthography and Manner of reciting the Korán' (*Not. et Ext.*, vol. viii.), and was likewise one of the most zealous contributors to the 'Magasin Encyclopédique,' the 'Mines de l'Orient,' and the 'Annales des Voyages.' On the return of the Bourbons in 1814, De Sacy, who had received from the Imperial government the title of baron, became a member of the Chamber of Deputies, and was also appointed a member of the Council for Public Instruction. He took a prominent part in founding the Asiatic Society of Paris, of which he was the first president. In 1816 he published, under the title of 'Calila et Dinna,' the Arabic text of the Fables of Bidpai, and the Moallakah (or suspended poem) of Lebid, with a French version and critical notes. In 1819 appeared the 'Pend-Nameh' (Book of Counsels) in Persian and French, with copious notes. The whole of the 'Makamat' (Sessions) of Hariri, in Arabic, with a commentary also in Arabic, was his next publication, the edition being made with so much care that it met with a ready sale even in eastern countries. In 1826-27 De Sacy published a new edition of his 'Chrestomathie Arabe,' with corrections and considerable additions; and in 1829 he added a supplementary volume, entitled 'Anthologie Grammaticale Arabe.' The second edition of his Arabic Grammar appeared in 1831. In 1832 Louis-Philippe elevated De Sacy to the peerage, and appointed him keeper of the Oriental MSS. in the King's Library, and Perpetual Secretary to the Academy of Inscriptions. De Sacy's last work was his 'Exposé de la Religion des Druses,' which appeared at the beginning of 1838, in two volumes, 8vo. On the 19th of February of the same year, as De Sacy was returning from the Chamber of Peers, where he had taken an active part in the debate, he fell in the street in a fit of apoplexy. He was removed to his house, where he died on the following day, in the eightieth year of his age. Oriental literature is greatly indebted to the labours of this distinguished scholar. He not only contributed to extend our knowledge of every branch of Oriental literature, but it was on his recommendation that professorships of Chinese, Sanscrit, and Hindostanee were established in Paris; and it was also under his direction that the Russian and Prussian institutions for Oriental studies were raised to their present eminence. A very able paper, giving an account of De Sacy's life and writings, was read on the 23rd of June, 1838, before the Academy, by M. Reinaud, who was his personal friend. It has since been published under the title of 'Notice Historique et Littéraire sur M. le Baron Silvestre de Sacy.'

SADDUCEES (Σαδδουκαῖοι), one of the four Jewish sects at the time of Christ. Their origin is unknown, for little dependence can be placed on the Rabbinical tradition which makes them the followers of Zadok, a disciple of Antigonus Soccho. They denied the existence of any spiritual beings except God, and believed that the soul died with the body, and therefore that there was no resurrection. (*Matt.*, xxii. 23; *Acts*, xxiii. 8.) In consequence of this disbelief in a future state of rewards and punishments, they were inexorable in punishing crimes. They rejected the doctrines of predestination and providence, maintaining that men were left to determine their own course without assistance or hindrance from God. They rejected the traditions of the Pharisees, and adhered to the text of the Mosaic law. They have been accused of rejecting all the books of the Old Testament except the Pentateuch; but the passage of Josephus, on which this charge is founded, does not sustain it. Though inveterately opposed to the Pharisees, they united with them against Christ. During the period to which the New Testament refers, they seem to have been the stronger party in the Sanhedrim, and some of their body were high-priests, as Caiaphas and Ananias. It seems that they considerably modified their opinions in progress of time, and received the doctrines of angelic beings and of the resurrection; so that at last they were only distinguished by their rejection of tradition, from which circumstance they obtained the name of Caraites, in the eighth century A.D.

(Josephus, *Antiq.*, xiii. 5, 9, 10, 6; xviii. 1, 4; *Jewish War*, ii. 8, 14; Prideaux's *Connection*; Jahn's *Biblical Antiquities*; Calmet's *Dictionary*; Winer's *Biblisches Realwörterbuch*.)

SADLER, SIR RALPH, the eldest son of [illegible] Sadler, Esq., was born at Hackney in Middle[illegible] where his family had been for some time settl[illegible] life he gained a situation in the family of Thom[illegible] earl of Essex, who introduced him to the no[illegible] VIII., by whom he was employed in the d[illegible] of the religious houses, and he had his full share [illegible] spoil. In 1537 he commenced a long series of [illegible] services in Scotland: in the first instance, chiefly [illegible] view of detaching that country from its close allia[illegible] France, and persuading the king of Scotland to [illegible] uncle's conduct toward the see of Rome and the [illegible]. [illegible] these objects however he failed. In 1540 he l[illegible] Cromwell, who was beheaded; but retained [illegible] Henry, who again sent him to Scotland in 15[illegible]. [illegible] death of James V., Sadler lent his aid to the [illegible] jected by Henry VIII. between his son Ed[illegible] young queen of Scotland, but this ended so [illegible] that in December, 1543, Sadler was obl[illegible] England, and Henry declared war agai[illegible] the meantime Henry was so satisfied with [illegible] even in this last negotiation, that he included him, by [illegible] title of Sir Ralph Sadler, Knight, among the twelve per[illegible] whom he named as a privy-council to the sixteen nobl[illegible] whom in his will he had bequeathed the care of his [illegible] of the kingdom. When this will was set aside by [illegible] tector Somerset, and it became necessary to conc[illegible] king's executors and privy-councillors by [illegible] nours, Sir Ralph Sadler received a confirma[illegible] church lands formerly assigned to him by Henry, with splendid additions. At the battle of Pinkie, Sir Ralph Sadler greatly distinguished himself, and was raised to the degree of knight-banneret on the field of battle; but we hear nothing more of him during the reign of Edward VI. [illegible] that in the fourth year of that king we find [illegible] tioned as master of the great wardrobe. In Que[illegible] reign, although he appears to have been in her fa[illegible] retired to his estate at Hackney, and resigned [illegible] clerk of the hanaper, which had been conferre[illegible] by Henry VIII. On the accession of Elizabeth [illegible] appeared at court, was called to the privy-cou[illegible] tained to his death a large portion of the est[illegible] princess. He was a member of her first par[illegible] of the knights of the shire for the county [illegible] When Elizabeth thought proper to favour the ca[illegible] Reformation in Scotland, and to support the nob[illegible] were for it against Mary, Sir Ralph Sadler [illegible] pal agent. He was also concerned in the [illegible] measures which led to the death of Mary, and [illegible] appointed her keeper in the castle of Tutbury; but [illegible] was Elizabeth's jealousy of this unfortunate princess [illegible] even Sadler's watchfulness became liable to her s[illegible] and on one occasion a heavy complaint was [illegible] him that he had permitted Mary to accompany [illegible] distance from the castle of Tutbury, to enjoy [illegible] hawking. Sir Ralph Sadler expostulated u[illegible] ble life which he passed at Tutbury, and upon [illegible] struction put upon his actions, and Mary was [illegible] mitted to a new keeper. Elizabeth however did [illegible] draw her confidence from Sir Ralph Sadler in other [illegible] and, after the execution of Mary, employed [illegible] court of James VI. to dissuade the Scotch ki[illegible] taining thoughts of a war with England on [illegible] count, to which, there was reason to think, he mig[illegible] excited. In this Sir Ralph had little difficulty in succ[illegible] ing, partly from James's love of ease, and partly fr[illegible] prospect he had of peaceably succeeding to th[illegible] England. This was the last time Sir [illegible] employed in the public service, for soo[illegible] from Scotland he died, at his lo[illegible] of [illegible] fordshire, March 30, 1587, in the [illegible] and was buried in the church of St[illegible] as decorated with the king of Scotland's standard, ie had taken at Pinkie.

ransactions of Sir Ralph Sadler's most memorable es are recorded in 'Letters and Negociations of Sir Sadler,' &c., printed at Edinburgh, 1720, 8vo., from the Advocates' Library: but a more complete col- was published of his 'State Papers and Letters,' y Arthur Clifford, Esq. of Tixal, his descendant, in 2 vols. 4to., to which was added, a 'Memoir of the Sir Ralph Sadler,' by Mr. (afterwards Sir) Walter ith historical notes: to which the preceding account ipally indebted.

OLE'TO, JA'COPO, born at Modena in 1477, at Ferrara, and afterwards at Rome. He applied especially to the Greek and Latin classics, and a distinguished scholar. Leo X. appointed him one secretaries, together with Bembo, and afterwards im bishop of Carpentras in the county of Avignon, kept him at Rome. After Leo's death, his successor, VI., who had no partiality for learned men, neglected , who repaired to his diocese of Carpentras. When t VII. ascended the pontifical throne, in 1523, he d Sadoleto his secretary. But Clement's tortuous ish policy disgusted Sadoleto, who asked and obtained return to his diocese, and accordingly he left Rome month before Bourbon and his band sacked the city. pentras he wrote several works; among the rest, a commentary on the Epistle of St. Paul to the Ro- Some expressions in this commentary, which referred bstruse doctrines of predestination and grace, were ed heterodox at Rome, and his work was prohibited. wrote to Paul III., who had succeeded Clement explanation of his opinions, which satisfied the d Sadoleto was cleared of all suspicion of heresy. ter he was made a cardinal, and was employed in important affairs. In 1542 he was sent as legate to I., to mediate a peace between that king and the Charles V., in which however he did not succeed. , being old and infirm, he obtained leave to resign f Carpentras in favour of his nephew Paul Sadoleto, ie had educated himself, and withdrew into retire- He died in 1547. His unspotted character, the s of his manners, his sincere piety, and his love of iave caused him to be compared with Fénélon.

eto wrote a work on education, 'De Liberis recte In- is,' which contains much excellent advice. He also lisputation, in two books, on the merits of philosophy, nodel of Cicero's 'Tusculanæ,' which Bembo praised as worthy of the Augustan age. A poem which he Latin hexameters, on the discovery at Rome of the the Laocoon, was likewise much admired.

YATTES. [LYDIA.]

TY LAMP. [LAMP, SAFETY.]

FLOWER, or *Bastard Saffron*, has already been under the botanical name of the plant [CARTHA- CTORIUS] yielding it, of which the generic name to be derived from the Arabic *koortum*, a term ap- ts seeds. This plant has been cultivated in Eastern s from the earliest times, both on account of the oil d from its seeds and for the colouring matter pro- from its flowers, which in their dried state form the r of commerce. The plant is noticed by Greek au- der the name *knekos* (κνῆκος); Arabian authors give as the Greek synonym of *koortum*. The oil of the Carthamus was valued by the antients as a laxative , and is still employed by the Asiatics for the same as well as for external application. It is most ex- used as a lamp-oil. The seeds are eaten by some pecially parrots, whence they are called 'graines de ts.' The plant is however chiefly cultivated on ac- its flowers, not only in China, India, and Egypt, in the south of Europe. That from China is the ued, fetching as high a price as 30*l*. per cwt., l Safflower is not worth more than 7*l*. per cwt. be remedied probably by selecting and sowing ed of the most highly coloured flowers, and then the Chinese method of gathering the crop when er is in the highest perfection, and only pick- he upper and coloured parts of the floret, instead hole floret, of which the lower part is whitish-co- Besides this, careful drying is essential to the pre- f the colour, or, as Mr. E. Selly has recommended, rying 'in close chambers with some organic substance, or perhaps with hot sand;' but the natural heat of the climate in darkened chambers would probably be sufficient.

SAFFRON consists of the dried stigmas of the *Crocus sativus*, a plant native of Greece and Asia Minor, but extensively cultivated in Austria, France, Spain, and also formerly in England. The Sicilian saffron is said to be the produce of the Crocus odorus, but both in antient and modern times this sort has been little esteemed. England is chiefly sup-supplied from France and Spain; that of Spain being preferred. In Germany however Spanish saffron is not in such repute as the Austrian, great pains being taken in the cultivation of the plant in that country. The cormi or stems are subject to the attacks of a fungus, Sclerotium Crocorum, by which they are extensively destroyed. When the flowers expand, and are thoroughly open under the influence of the sun, the stigmas, of which there are three, are plucked out, a portion of one style remaining attached to them, and spread upon paper, to be dried either by means of portable kilns over which a hair-cloth or fine sieve is stretched, or in a room by the sun. The stigmas are from an inch to an inch and a half long, narrow and roundish where they are attached to the style, but spreading out and club-shaped towards the apex, which is truncate. The upper part is of an orange or brownish red; the part of the style termed Fominelle is yellowish. The stigmas have a penetrating, aromatic, and, when in large quantity, stupifying odour, and a bitter aromatic taste; by mastication the mouth and saliva are rendered yellow. By long internal use of them many of the secretions acquire a yellow colour. The stigmas of Crocus Pallasii, C. longiflorus, and C. Susianus are not so long as those of the genuine saffron crocus, and are altogether devoid of the strong odour. They and many other articles, such as the florets of the safflower (Carthamus tinctorius), those of the marigold (Calendula officinalis), slices of the flowers of the Punica granatum, and pieces of dried flesh are used to adulterate the true saffron. The saffron of English commerce is generally very pure; but the high price offers much temptation to sophistication, which might be diminished by collecting the stigmas of the Crocus vernus, which are little inferior in colour or potency to those of the autumnal crocus. According to Mr. Pereira, one grain of good saffron contains the stigmata and styles of nine flowers; hence 4320 flowers are required to yield one ounce of saffron. Saffron was formerly met with in two forms, *hay saffron* and *cake saffron*, the former is now alone in demand, the latter being entirely an artificial compound of the florets of the safflower, gum, and some other materials. Genuine saffron is often moistened with oil, which gives an appearance of freshness to old and dry saffron; but the mixture is easily detected. Saffron consists of a volatile oil, in variable proportion, which is heavier than water, of polychroite, which is a compound of a volatile oil and a bitter red substance (or polychroite properly so called), gum, and other principles. [POLYCHROITE.]

Saffron had formerly many powerful and important properties assigned to it, none of which, on the most careful experiments, it is found to display, except in the cases of a very few susceptible persons, who suffer from the odour, as is found in other instances—of the violet, &c. [AROMATICS.] On the Continent it is much used as a condiment with food. In England it is used in medicine, chiefly as a colouring principle. It is also employed as a dye.

SAFFRON WALDEN. [ESSEX.]

SAGALASSUS. [PISIDIA.]

SAGAN, a mediatised principality in Lower Silesia, 450 square miles in extent, with 42,000 inhabitants, is a circle of the government of Liegnitz in that province. It was originally a part of the principality of Glogau, and in consequence of a partition between the sons of Henry VIII., in 1395, it had princes of its own. It came afterwards to the crown of Bohemia, and was given by the emperor Ferdinand II. to the celebrated Wallenstein, after whose murder it reverted to the crown. It was sold in 1646 to Prince Lobkowitz, from whose family it was purchased, in 1786, for 1,100,000 florins, by Peter Biron, duke of Courland, on whose death, in 1800, it fell to his eldest daughter and heiress, Catherine, princess of Courland, who took the title of duchess of Sagan. Sagan, the capital of the principality, is situated on the right bank of the river Bober. It is strongly fortified, has three gates, three suburbs, two handsome squares, and a fine ducal palace, with beautiful gardens and park. The inhabitants, now nearly 6000, are for the most part Roman Catholics. There are six Roman Catholic churches and chapels, one Protestant church, a Roman Catholic gymnasium, several Protestant and Catholic schools, a seminary for Roman Catholic schoolmasters, a theatre, and three hospitals. The inhabitants manufacture linen, woollen cloths, calicos, sealing-wax, paper, and looking-glasses. On an antient tower near one of the gates the celebrated astronomer Kepler had an observatory in the time of Wallenstein, who possessed the principality from 1627 to 1634.

SAGAPE'NUM, said by Willdenow to be yielded by Ferula persica, which no one regards as certain, though it is generally believed to be furnished by some species of Ferula. The plant (or plants) which yield it grow in Persia and other regions of the East. It is procured in the same way as assafœtida. It occurs either in tears or irregular masses, of a dirty brownish colour, containing in the interior white or yellowish grains. It is difficult to break (unless when very old), is tenacious, and not easily powdered, except in winter. It has the same alliaceous odour, but less powerful, as assafœtida, with a nauseously bitter, acrid, guttural taste.

It consists of, in the 100 parts, according to Pelletier:—

Resin	54·26
Gum	31·94
Bassorin	1·0
Peculiar substance	0·60
Acidulous malate of lime	0·40
Volatile oil, including loss	11·80
	100·

Brandes found only 3·73 per cent. of volatile oil, and less resin than in the above; and Geiger says it has less volatile oil than asafœtida; while Pelletier's analysis gives nearly three times as much. The resin, by the action of hot hydrochloric acid, becomes first reddish, then blue, and at last brown. Formerly there were two kinds of Sagapenum in commerce, but at present only the worst of the two is met with. It is said to be adulterated with assafœtida and bdellium. Its action on the human system is the same as that of assafœtida and other fetid gum-resins. [ASSAFŒTIDA.]

SAGE. [SALVIA.]

SAGE, LE, ALAIN-RENE', was born May 8, 1668, at the village of Sarzeau, which is situated on the peninsula of Ruis in the department of Morbihan, in France, about ten miles from Vannes, the capital of that department. His father, Claude Le Sage, who was a lawyer, and held the office of registrar of the Cour Royale of Ruis, died in 1682; he bequeathed a moderate property to his son, and entrusted both son and property to an uncle, who sent young Le Sage to be instructed in the Jesuits' college at Vannes, where he became an especial favourite of Père Bochard, then at the head of that college, who bestowed much pains on his education. The uncle is said to have dissipated the property, and young Le Sage, on leaving the college, appears to have obtained and held for five or six years an office in the collection of the taxes in his native province of Brittany.

Le Sage, having been deprived of his office, went to Paris in 1692, with the intention of going through a course of philosophy and law, and at the same time of making interest to obtain another situation. His handsome person and agreeable manners, his talents, and his taste for elegant literature procured him admission to the best society. In 1694 he married the daughter of a citizen of Paris. Danchet, with whom he had become intimate while prosecuting his studies in the university of Paris, persuaded him to produce, from the Latin version of Jaques Bongars, the Letters of Aristænetus, which is rather an imitation than a translation. It was printed in 1695 at Chartres, but with the imprint of Rotterdam, 1 vol. 12mo., at the expense of Danchet, who was then professor of rhetoric at Chartres.

Le Sage had been admitted avocat au parlement de Paris, but he subsequently dropped the designation, and also relinquished some small office which he held, in order that he might devote himself to literature. The Abbé de Lyonne became his patron, and bestowed upon him a pension of 600 livres; and to him also Le Sage appears to have been indebted for his introduction to the Spanish language and literature. He now produced 'Le Traître puni,' a comedy in five acts, imitated from the 'Traicion busca el Castigo' of F. de Roxas (Paris, 1700); 'Don Felix de Mendoce,' taken from a piece by Lope de Vega (Paris, 1700); and 'Le Point d'Honneur,' a comedy in five acts, from the 'No hay Amigo para Amigo' of F. de Roxas, which was performed at the Théâtre Français, but with little success. The two first plays were not represented, and the last, when he afterwards reduced it to three acts, and brought it out at the Théâtre Italien in 1725, under the title of 'L'Arbitre des Différends,' was only played twice. Le Sage's next effort was '[illegible] Nouvelles Aventures de Don Quichotte,' translated [illegible] Avellaneda's frigid continuation of the work of Cerv[illegible] (1704-1706, 2 vols. 12mo.). This translation obtain[illegible] little favour from the French public as the o[illegible] from the Spanish.

Le Sage was now 38 years of age, and his labours [illegible] hitherto been to little purpose; but he had b[illegible] himself for a brighter display of his powers. [illegible] himself familiar with the literature of the [illegible] unrivalled for its richness of invention; he had [illegible] his mind with Spanish scenes and incidents [illegible] drawn from that great storehouse; and he ha[illegible] ing his style, originally formed on the sound [illegible] classical education, by free translations. In 170[illegible] Ursin,' a comedy in five acts, imitated from Cal[illegible] performed at the Théâtre Français without su[illegible] little piece of his own, 'Crispin, Rival de [illegible] played at Paris on the same day, had a brill[illegible] indeed is said, in liveliness, interest, and e[illegible] dialogue, to be hardly inferior to Molière. [illegible] appeared his 'Diable Boiteux,' of which he ha[illegible] name and the leading idea from 'El Diablo Coj[illegible] Luis Velez de Guevara, and of which inde[illegible] it [illegible] a continuation (Paris, 1707). Its success [illegible] which was no doubt in a great measure ow[illegible] to the satire being aimed at contemporary ch[illegible] nence in Paris; but the true drawing and [illegible] its pictures, which are copied from all ranks of soc[illegible] its nervous, clear, and correct style, have made its [illegible] lasting. In 1726 he augmented the work by an [illegible] volume, and in 1737 added to it the 'Entretien [illegible] minées de Madrid,' and 'Les Bequilles du Diable [illegible] the first a continuation of the work by Le S[illegible] and the last a eulogy of it by the Abbé Bordelo[illegible]

Le Sage had offered to the Théâtre Français a [illegible] one act called 'Les Etrennes,' which was to have been performed January 1, 1708, but the actors refused to play it: upon which Le Sage extended it to five acts, and [illegible] the title of 'Turcaret.' The piece was levelled at [illegible] ruptions of those who managed the revenue and [illegible] taxes, the maltotiers, traitants, and others of [illegible] This powerful body, being aware of the aim of the [illegible] which Le Sage had read some parts to his li[illegible] used their utmost exertions to prevent its [illegible] and even offered the author, it is said, 100,000 [illegible] suppress it, but he refused the bribe. They had [illegible] cess however with the players, and would have [illegible] if an order of Monseigneur, dated October 13, [illegible] not been addressed to the actors in these te[illegible] seigneur having been informed that the ki[illegible] object to perform ('font difficulté de jouer') a[illegible] "Turcaret, ou le Financier," commands them to [illegible] to play it forthwith.' The performance took place [illegible] 14, 1709, and the success was even greater than [illegible] anticipated. This comedy is entirely Le Sage's [illegible] is greatly superior to any of those which he [illegible] rowed from the Spanish. A little piece called 'La [illegible] tine,' which had been accepted at the Théâtre Fran[illegible] was, owing to intrigue within or without the t[illegible] performed till 1732. Disgusted with this and [illegible] duct of a similar kind, Le Sage resolved to relinqu[illegible] legitimate drama and the royal theatre. We find [illegible] 1710 assisting his friend François Petis de [illegible] was then beginning to publish his 'Mille et [illegible] correcting the language and improving the style [illegible] translation.

Le Sage's next work was his novel of 'Gil [illegible] tillane:' 2 vols. 12mo. were published in 17[illegible] 1724, and vol. 4 in 1735.

Three different and indeed discordant charges have b[illegible] made against this work.

The first charge was made by Bruzen de la Marti[illegible] and followed up by Voltaire, who says ('Siècle de [illegible] XIV.') that the novel is entirely taken fr[illegible] he [illegible] de la Vida del Escudero Don Marco[illegible] cent Espinel. This charge was soon found [illegible] as it was malignant, by merely looking into [illegible] which presents no resemblance to the work [illegible] either in the narrative, the characters, or the d[illegible]

:t charge was made by the Jesuit Father Isla, ated 'Gil Blas' into Spanish, and gave it the title as de Santillana buelto á su Patria.' This work ted by the Père Isla at Bologna in Italy, in 1781, t published till 1787 (Madrid, 4 vols. 4to.). Isla 33. He asserts that 'Gil Blas' was originally Spanish in 1635; that the work was denounced rnment of the day, which prohibited the printnd seized the MS.; but that the author, having o take a copy, fled with it to France, where he 10; that this MS. having accidentally fallen into of Le Sage, he formed his 'Gil Blas' out of it. asserted that a MS., apparently that which had l from the author, is still in the Escurial, and . is evidently not a translation from the French is statement is disproved by the facts that Isla Le Sage's work, and not the original, that such s never been published, and that there is no 'its having ever been seen.

ro charges were examined and refuted by Le çois de Neufchâteau, in an 'Examen de la Quesoir si Le Sage est Auteur de Gil Blas, ou s'il l'a pagnol,' 1819.

charge was made by the Jesuit Llorente, in a ne published in 1822, 'Critical Observations on ce of Gil Blas,' in which he asserts that it is an unpublished work called 'The Bachelor of ' We have not the means of examining into ars of this charge, but have no doubt that it is ounded as the two former.

had ceased, as we have said, to write for the ançais, but he had three sons and a daughter, he means of respectable subsistence must be pro- Sage's character was one of independence, and have had a preference for the fruits of honest a time when place and pension were eagerly pulously sought for by literary men in France. reputation had now become, he was not ashamed about six and twenty years of his life—1713 to riting small pieces for the theatrical exhibitions s of St. Germain and St. Laurent. Fuzelier, Autrau, Piron, Lafont, and Fromaget were his rers. Upwards of 100 pieces were produced in above mentioned, of which Le Sage was the sole 4, and conjointly of many of the others. These hardly an exception, were excessively popular. ed the greater part of them, in conjunction with in a collection which they called the 'Théâtre ,' 9 vols. 12mo. and 10 vols. 12mo.

ean time however Le Sage was occupied with ositions. His 'Roland l'Amoureux,' an imitathan a version of Bojardo's 'Orlando Innamoublished in numbers from 1717 to 1721. He is e got rid of most of the exaggerations of the to have lost his fire. In 1732 appeared 'Les le Guzman d'Alfarache,' a compressed imitation a y Hechos del Picaro Guzman de Alfarache' of it superior to the original, and which has enseded the previous translations. In the same lished 'Les Aventures de Robert dit le Chevauchesne,' 2 vols. 12mo. This work is not proon, but a narrative of the extraordinary advenpirate, extracted from the memorials furnished w. This was followed in 1734 by the two first 'Histoire d'Estevanille Gonzales, surnommé le bonne Humeur,' 2 vols. 12mo., which La Sage be an imitation of 'El Escudero Obregon' bened, but to which it bears little resemblance exew circumstances of narrative which have been In 1735 he published 'Une Journée des Parques,' logue full of philosophy and wit, the thoughts iginal, and expressed with great energy. This e year in which he completed 'Gil Blas,' a work ems to have written especially for posterity, and devoted a large portion of the best period of his 38, the year in which he produced the last of his , he published 'Le Bachelier de Salamanca,' 2 ., and in 1740 'La Valise trouvée,' 12mo., ly, which consists of about thirty letters supwritten by different persons on satirical subjects. rk was 'Un Mélange amusant de Saillies d'Esprit Historiques les plus frappants,' 1 vol. 12mo. appears to have passed his life of literary activity in great domestic happiness, which was only disturbed by his eldest and his third son having become actors, a profession to which Le Sage had a strong dislike. He had brought his eldest son up to the bar, but he left it, and, under the assumed name of Montménil, acquired a high reputation as an actor. Le Sage had ceased to have any intercourse with him; but the second son, who had obtained the preferment of a canon at Boulogne-sur-Mer, contrived, by a manœuvre, to get the old man to see his son play a character in 'Turcaret,' with which he was so much delighted that a reconciliation took place, and they afterwards lived on terms of the greatest friendship. It is related that while Montménil was at the theatre, Le Sage passed his evenings at a café in the neighbourhood of his residence, where the company used to assemble round him, and to get upon chairs and tables to listen to 'the old man eloquent.' The death however of this favourite son, in September, 1743, at the age of forty-eight, was a severe blow for him.

At the end of 1743 he retired to Boulogne, with his wife and daughter, in order to be near his son the canon, and here he died, November 17, 1747. His wife survived till 1752: both of them died at the age of eighty.

The great work of Le Sage is his 'Gil Blas,' perhaps of its kind the first of all novels, and one that has the rare merit of always being read with new pleasure. This superiority is not owing to the interest of the story, for when a story is well known, a novel loses that part of its attraction, and its permanent success must depend on other qualities. When a person has finished a chapter of 'Gil Blas,' he will generally have nearly equal pleasure in beginning to read it over again; and the reason is this—'Gil Blas' is a series of pictures of human life under all its aspects. The various adventures of Gil Blas concern us little; we only recollect him because of the persons with whom through him we become acquainted. We neither like him nor dislike him; we do not admire or respect him. He introduces us to a great variety of personages of all classes and conditions, whose failings and vices are painted in enduring colours. Though somewhat of the interest of the novel arises from the great variety of adventures, and the delineation of manners peculiar to Spain, it is as a gallery of portraits that the work will always maintain its interest. It is true that the author generally gives us the portraits of rogues or fools, or of persons whose distinguishing trait is some weakness of character; but it is also true that the portraits are likenesses, and represent a large class. As in all great works of the kind, the author is never obtruded on us. We think not of the wonderful art which has produced what appears to be completely simple and natural. It would be difficult to find an idle or unmeaning phrase in the whole book, particularly in the first two volumes, which in many respects are the best. The expression is suited to the thought with perfect propriety; there is nothing superfluous, and nothing wanted in the way of explanation. While we admire the innumerable delicate touches which make up the whole of a picture, we find them blended in one harmonious whole, to which each part bears its just proportion; a merit which arises from the author's clear perception of what was required for the delineation of each character, and the exquisite taste which guided him to the adoption of a pure, simple, and nervous style of expression. A great work or a great intellectual power of any kind is always the fruit of mature years. Le Sage, as already observed, published the first two volumes of Gil Blas in 1715, when he was 47 years of age, and the fourth and last in 1735, when he had attained his 67th year.

The greater part of the works of Le Sage have been collected and published under the title of 'Œuvres Choisies de Le Sage,' Paris, 1783, 15 vols. 8vo., and 1810, 16 vols. 8vo. Most of his novels have been frequently reprinted, but especially 'Gil Blas,' which has appeared in all forms from the most splendid typography and embellishments to the humblest. It has been translated into all the languages of Europe; the English translation is by Dr. Smollett. 'Le Diable Boiteux' is translated into English under the title of 'The Devil on Two Sticks;' and we have also translations of the 'Bachelor of Salamanca,' and of most of the other novels.

SAGERE'TIA, a genus of plants of the natural family Rhamneæ, formed, by M. A. Brongniart, of old species of Zizyphus and of Rhamnus, and named after M. Sageret, a French vegetable physiologist. The species are found in both South and North America, Java, China, and in India along the foot of the Himalayas. The genus is characterised by having a five-cleft pitcher-shaped calyx; petals five, convolute or cucullate; stamens five, bearing ovate two-celled anthers; disk fleshy, cup-shaped, girding the ovary; ovary almost immersed in the disk, three-celled; style short, thick; stigmas three, sessile or three-lobed; fruit unknown. The species form shrubs, with slender, usually thorny branches; leaves nearly oblong, lanceolate and serrate; flowers small, crowded in axillary or terminal spikes. The only species which requires particular notice is S. thee'-sans, which is remarkable as being employed as a substitute for tea, even in China, where the poor are described by Osbeck as making use of the leaves in the same manner as those of the true tea, and for which it makes a good substitute from its astringency and fragrance.

SAGHALIEN. [TARAKAI.]

SAGI'NA, the name of a genus of plants, from *sagino*, to cram or fatten, a name not very appropriate. This genus belongs to the natural order Alsinaceæ, and is characterised by possessing an inferior calyx, with four spreading permanent sepals, four ovate obtuse petals, shorter than the calyx, four stamens, superior ovary, with four short styles, capsule splitting into four valves, and numerous minute seeds attached to a central placenta. Four species are indigenous to Britain. They form small herbs, which are very generally diffused over the temperate regions of the globe.

SAGITTA (the Arrow). This constellation is one of the old ones, and is situated over the back of AQUILA. In CONSTELLATION it is stated that Sagitta is a part of Aquila in Aratus; but this, though very commonly stated, is erroneous, as is noticed by Grotius in his notes on Aratus; though the edition of Grotius himself countenances the error in the plates. Grotius traces the mistake to Germanicus in his Latin version.

The principal stars are as follows:—

Character. Not in Bayer ( )	No. in Catalogue of Flamsteed.	No. in Catalogue of Astron. Society.	Magnitude.
	1	2231	6
	2	2263	6
ε	4	2298	6
α	5	2305	4
β	6	2309	4
δ	7	2322	4½
ζ	8	2327	6
	10	2342	6
	11	2347	6
γ	12	2348	4
(x)	13	2353	6
(y)	14	2362	6
(z)	15	2365	6
η	16	2366	6
	18	2390	6

SAGITTA'RIA (from *sagitta*, an arrow, a term indicating the shape of the leaves), the name of a genus of plants belonging to the natural order Alismaceæ. The genus is characterised by possessing barren and fertile flowers, with a 3-leaved calyx and three petals. The fertile flowers have numerous pistils collected into a head, and one-seeded compressed and margined pericarps. The species of this genus are water-plants, and are found in the hotter and temperate parts of the globe, and are frequently remarkable for the beauty of their flowers. The only species indigenous in this country is the *S. sagittifolia*, common arrowhead, which is known by its arrow-shaped leaves with lanceolate straight lobes. The rhizomata of many of the species contain amylaceous matter, and form a nutritious food, for which purpose they are said to be used by the Calmuc Tartars.

SAGITTA'RIUS (the Archer), one of the constellations of the zodiac, the figure of which is that of a centaur drawing the bow, and situated below Aquila, between Scorpius and Capricornus: it must not be confounded with CENTAURUS. The mythological account of this constellation is very meagre, and confirmatory of the reason given in CONSTELLATION why the Greeks could not have been the first to give names to the constellations. Hyginus can find no more illustrious mortal to fix in this part of the heavens than one Crotus, the son of Eupheme, the nurse of the Muses; but it is worth noting that he says many (in his t

nied that the original figure was that of a centaur.

The principal stars are as follows:—

Character. Not in Bayer ( )	No. in Catalogue of Flamsteed, (Piazzi,) [Bradley,] Zach, Z.	No. in Catalogue of Astron. Society.	Magnitude.	Character. Not in Bayer ( )	No. in Catalogue of Flamsteed, (Piazzi,) [Bradley,] Zach, Z.	No. in Catalogue of Astron. Society.	Magnitude.
	2	2020	6	β²	(62)	2244	4
(p)	3	2039	6		(67)	2246	7
b*	4	2054	6¼	α	(68)	2252	4½
(i)	5	2056	7	(v¹)	(79)	2126	6
	6	2062	7		(82)	2128	6
a†	7	2067	6	(p)	(84)	2255	6
	9	2074	7		(88)	2130	7
γ	10	2079	3		(92)	2132	6
μ	13	2096	4		(94)	2133	7
	14	2097	7	(v²)	(96)	2135	6½
	15	2098	6		(99)	2136	7
	16	2099	7		(102)	2140	7
	17	2102	7	(O)	(102)	2261	6
δ	19	2105	3		(107)	2262	6
ε	20	2110	3		(110)	2264	7
	21	2118	6		(112)	2144	7
λ	22	2122	4		(117)	2006	6½
	24	2141	7		(121)	2149	7
	26	2157	6		(125)	2150	6½
φ	27	2163	5	(Q)	(126)	2273	7
	28	2164	7		(129)	2152	6
τ	29	2174	6		(131)	2154	6½
	30	2175	6		(138)	2276	6
	31	2176	6	(s)	(155)	2162	6
ν¹	32	2179	5		(159)	2282	7
	33	2178	6		(162)	2024	7
σ	34	2180	3¼		(165)	2285	6½
ν²	35	2181	5		(166)	2286	7
ξ¹	36	2185	5		(176)	2291	7
ξ²	37	2187	4		(180)	2293	7
ζ	38	2196	3		(186)	2029	7
ο	39	2205	4		(201)	2300	6½
τ	40	2208	4		(223)	2040	7
π	41	2220	4		(225)	2183	6
ψ	42	2227	5		(227)	2042	5½
d	43	2230	6		(230)	2310	6
ρ¹	44	2248	5		(231)	2044	7
ρ²	45	2250	6		(237)	2312	6½
υ	46	2251	6		(243)	2047	7
χ¹	47	2256	6		(255)	2195	6½
χ²	48	2257	8		(260)	2197	7
χ³	49	2258	6		(261)	2199	6½
	50	2260	6		(265)	2318	6½
h¹	51	2287	6	(S)	(267)	2202	6
h²	52	2290	5		(271)	2319	7
	53	2299	6		(293)	2212	7
e¹	54	2302	6		(294)	2211	6½
e²	55	2308	6		(294)	2052	5
f	56	2313	6	(E)	(297)	2331	
	57	2328	6		(301)	2215	
ω	58	2335	5		(304)	2057	6½
b	59	2339	5		(312)	2063	6
a	60	2344	5		(316)	2221	7
g	61	2343	6		(323)	2069	6
c	62	2352	6	γ¹	(339)	2076	5
	63	2354	6		(342)	2078	7
(Y)	64	2361	6		(351)	2349	6
	65	2364	6		(356)	2083	7
	(4)	2224	6		(359)	2085	5
	(5)	2223	7	(L¹)	(366)	2355	5
	(7)	2225	6½		(367)	2088	6
	(22)	2229	6¼		(369)	2356	6½
g	(24)	2103	5½		(386)‡	2093	6
(R)	(29)	2378	6		[2402]	2217	6½
	(50)	2236	6		1220 Z	2123	6
	(52)	2114	6		1294 Z	2270	6
β¹	(54)	2240	4		1299 Z	2280	7
	(61)	2241	6		1324 Z	2345	7

* So marked erroneously: Bayer's b is 59.
† Ditto ditto: Bayer's a is 60.
‡ This is the star which an error in reduction made Flamsteed mark

a woid signifying, in the language of the Papuas,
e it constitutes the staple article of food of the
of the Eastern Archipelago and other parts
plants which yield it grow. It is not a seed,
ies supposed, but the farina from the stem of
lms and palm-like vegetables, the chief of
he Sagus Rumphii, Willd. (Metroxylon Sagus);
lævis, Rox.: the Saguerus Rumphii, Rox. (Gonmuto, Rumph.; Sagus vinifera, Pers.); the
rinifera, Corypha umbraculifera, some Cycases,
Zamia, but these last yield a very inferior sort.
of Dolichos chinensis are used in North America
and also a starch procured from the tubers of the
s Batatas is beat up with the farina of the
ribæa into sago in the West Indies. Of late years
sago has been brought from Brazil, which is most
red from the Mauritia flexuosa, and some of the
ificent palms of that country. Sago is a variety
repared by the plant for the use of the flowers
nd is most abundant just before the evolution or
of the spadix or flower-bud, which is known by
lust transuding through and covering the leaves.
e the stem is cut down, near the base, and then
pieces of five or six feet in length. 'A part of
ard wood is then sliced off, and the workman,
the pith, cuts across the longitudinal fibres and
gether, leaving a part at each end uncut, so that
xcavated there remains a trough, into which the
n put, mixed with water, and beaten with a piece
e fibres, being then separated from the pulp, float
and the flour subsides. After being cleared in this
several waters, the pulp is put into cylindrical
de of the leaves of the tree; and, if it is to be
time, those baskets are generally sunk in fresh
ep it moist, for the pulp will keep long if pre-
the air, but if exposed it presently turns sour.'
oyage to the Moluccas, p. 39.)
tity yielded by one tree is prodigious. Five or
l pounds are not an unusual produce for one tree;
vegetation still remains after being felled, a stem
s up, which goes through the different stages of
it is fit for the axe.
or powder is rarely imported, granulated sago
ate in which it is commonly brought to Europe.
into this state from the flour, it must be mois-
ssed through a sieve into an iron pot (very shallow)
fire, which enables it to assume a globular form.
r grained sago is half baked, and will keep long.'
Of this granulated sago there are two varieties,
or brown sago, and pearl sago. The latter is in
horny or semi-transparent grains, about the size
head; the former are in larger grains, about
the grains of pearl barley. Both are inodorous,
n insipid taste. They swell in cold water, and
horoughly soluble in boiling water, so as to form
h-like solution, which may be used as a pudding,
in other ways as an article of diet for children
s, if a farinaceous diet is required.

IN. [JACCHUS, vol. xiii, p. 69.] The term *Sa-*
agoins is also employed by M. F. Cuvier and
stinguish the second division of the monkeys of
Continent, with long but not prehensile tails.
division M. Lesson arranges the genera *Sagui-*
.; NOCTHORA, F. Cuv.; and *Pithecia* [SAKIS],

us *Saguinus* is thus defined by M. Lesson:—
cter as in the SAPAJOUS, excepting that the ears
rge and deformed, and that the tail is covered
hairs. Body slender. Facial angle, 60 degrees
ormula:—

rs $\frac{4}{4}$; canines $\frac{1-1}{1-1}$; molars $\frac{6-6}{6-6} = 36$.

on arranges the following species under the
ciureus, *personatus*, *lugens*, *amictus*, *torquatus*,
lanocheir, and *infulatus*.

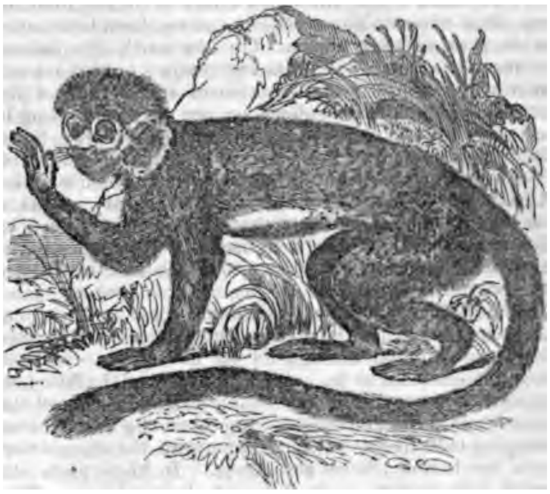
, *Saguinus Sciureus*.

ion.—Size about that of a squirrel, hardly more
ches in length without the tail, which measures
fourteen inches. Body greenish yellow above,
reyish on the thigh and arms; body beneath,
te. Feet, legs, and fore-arms reddish chestnut.
k; the rest of the face and ears flesh-coloured.
at the tip. In both extremities the nails of the
thumbs are broad: those of the rest of the fingers are more claw-like.

This is the *Simia sciurea*, Linn.; *Callithrix sciureus*, Geoff.; *Sagoin Saïmiri*, and *Saïmiri* of the French; *Saimiri* of the natives of the Orinoco; and *Titi* of Humboldt.

Localities.—Brazil and Guyana.

This pretty species is often kept by the natives in confinement. One in the Paris menagerie is described by M. F. Cuvier as very playful and good-humoured. The tail, when the animal was at rest, was wound round the body or limbs, a position in which it was kept when the little creature slept, which it did in a sitting posture, with the head bent down between the fore-legs; but the tail was never used as a support. This is not an uncommon species.



The Saimiri.

Cuvier will not allow the *Sagouins* and *Saïmiris* to be classed together, and indeed he separates the *Saïmiri* above described and figured from the *Sagouins*, making the *Sakis* intervene between the forms. He says that in the *Saïmiri* the tail is depressed, and ceases to be prehensile, and that the head is very flat. He also observes that there is a membranous space in the interorbital partition in the skeleton.

Of the *Sagouins* (*Callithrix*, Geoff.) he says that they have the tail slender, and that their teeth do not project, remarking that they had for a long time been associated with the *Saïmiris*, but that the head of the *Sagoins* is higher, and that their canines are much shorter. Such, he observes, are the *Sagouin à masque* (*Callithrix personata*, Geoff.), and the *Sagouin en deuil* or *La Veuve* (*La Viduita*, *Simia lugens*, Humb.).

The first of these, *Callithrix personata* (*Saguinus personatus*) is greyish-yellow, with the head and the four hands black, and a reddish tail.

Locality.—Brazil, where it is found between the 18th and 21st degrees of south latitude, on the banks of rivers.

The second, *Callithrix lugens* (*Saguinus lugens*), has the body of a shining black, with a purplish lustre on some parts: the hair soft and shining. The face has the appearance of a bluish-white square mask, which is surrounded by a narrow margin of a purer tinge, while two stripes of the same colour run from the eyes to the temples. The throat is marked with a band of white, of which colour are the anterior hands on the outsides, so that they there resemble a pair of white gloves, to which the natives compare them.

Habits, Localities, &c.—This species, which is the *Macaca cahou* of the natives, appears to be extremely rare. Humboldt saw only one specimen, and that in the forests bordering the rivers Cassiquiare and Guaviare. It was said to live in pairs; and this opinion was confirmed by the fear and dislike shown by the captive when placed near even some of the most diminutive species of the genus. It was very shy, and was active only when alone. When in the vicinity of persons, though they were occupied in general business, it would remain immoveably attentive to all that passed, refusing food even, notwithstanding a long fast. When alone its behaviour was very different. If a bird was introduced, the monkey was instantly roused at the sight of it, darted upon it like a cat, and swallowed it instantly, its whole habit at such moments being that of a carnivorous ani

SAGUENAY, River. [Canada.]

SAGUERUS. [Areng.]

SAGUNTUM. [Punic Wars.]

SAHA'RA, or **SAHRA**, is a country of immense extent, which occupies the central parts of Northern Africa. Its western extremity is washed by the Atlantic, along which it extends from Cape Nun, 28° 46′ N. lat., to the mouth of the river Senegal, 17° N. lat. From the shores of the Atlantic it extends eastward nearly across the continent of Africa, being separated from the Red Sea only by the valley of the Nile and the rocky country which lies between that river and the Red Sea. The valley of the Nile constitutes the eastern boundary of the Sahara. The western edge of that valley occurs between 30° and 32° E. long., and as the African shore along the western boundary of the Desert is between 11° and 17° W. long., the Sahara extends from east to west, on an average, through 44 degrees of longitude, or about 2650 miles. The northern and southern boundaries are very imperfectly known. On the north the Sahara reaches to the base of the Atlas Mountains; but we are unacquainted with the exact position of this portion of the mountains, which is laid down on our maps according to the vague information collected from the natives. Some geographers suppose that between the Atlas and the Sahara a fertile and tolerably level country occurs, which is called Biledulgorid, or Balad-al-Jarid, *i.e.* the country of palm-trees; but it is more probable that this name is applied by the Moghrebins to the southern declivity of the Atlas, as the valleys in those parts, being open to the Sahara, experience that extraordinary degree of heat without which dates would not ripen, or at least would not come to perfection. The Atlas constitutes the northern boundary of the Sahara from Cape Nun on the west to 10° E. long. on the east. From this meridian as far east as the valley of the Nile (30° E. long.), a stony and broken country extends between the Sahara and the Mediterranean, comprehending the countries belonging to Tripoli, including Barca and the stony desert which lies between Barca and Egypt. In these parts the northern boundary of the Sahara is better known. The hilly and stony country terminates on the south between 29° and 30° N. lat., except between 15° and 20° E. long., where a wide and mountainous tract advances to the south as far as 27° N. lat. The northern edge of this tract is known by the name of Harutsh-el-Assoud, or Black Harutsh; it is the Mons Niger of Pliny. It consists chiefly of basalt, and rises towards its extremity to a considerable elevation. The southern edge, called Harutsh-el-Abiad, consists of calcareous hills of moderate elevation. This rocky region terminates in the desert near 20° E. long., and on the east of it the Sahara appears to extend to the shores of the Mediterranean. Hornemann, when crossing the plain of Sultin, east of the Harutsh-el-Assuat, near 29° N. lat., did not perceive any mountain or even hill towards the north; and Della Cella, who travelled at a short distance from the shores of the Gulf of Sidra, south of 30° N. lat., observes that no mountains were visible, and that only low sand-hills appeared near the shores. It seems then that between 17° and 19° E. long. an arm of the Sahara reaches the shores of the Mediterranean, at the innermost corner of the gulf of Sidra or Greater Syrtis, and the rocky region of Barca is thus divided from that district, of which the ranges of the Harutsh constitute the most eastern portion. This northern branch of the Sahara has probably an average width of about 100 miles. On the shores of the gulf it occupies the space between Geria and Haen-Agan.

The southern boundary of the Sahara is best known towards the Atlantic, where it extends to the vicinity of the Senegal river, and between 15° and 4° W. long. approaches the parallel of 15° N. lat. Farther east the river Joliba or Quorra constitutes the dividing line between the Desert and Soodan as far as the meridian of Greenwich, so that Soodan advances to 17° N. lat., near Timbuctoo. Between that place and the lake Tchad the exact line of the boundary is not known, but it probably lies near 14° N. lat., and this parallel may also be considered as dividing the Sahara from Eastern Soodan as far as the frontier of Dar-Fur, near 23° E. long. Farther east it lies between 16° and 17° N. lat. We may therefore suppose that on an average the Sahara extends from north to south over 14 degrees of latitude, or 960 miles. The area of the Sahara, within these limits, occupies more than 2,500,000 square miles, or more than two-thirds of the area of Europe.

The Sahara is a desert, but it is not, as is commonly supposed, covered in its whole extent by a fine and loose sand. There certainly are tracts of considerable extent, the surface of which is covered with a thick layer of fine and loose sand, and with low sandy hills; but if we may judge from the scanty information that we have respecting this immense country, it would seem that the greater part of it consists of a firm soil, in many parts composed of indurated sand, in others of sandstone. The surface of other tracts consists of rocks, especially granite, frequently mixed with quartz. But whatever may be the soil in any given place, it is extremely poor, and almost entirely destitute of vegetation. It is true that there are tracts covered with bushes and coarse grass, but they are few, and invariably of moderate extent. This general sterility is chiefly owing to the dryness of the atmosphere. The Sahara is situated in that part of the globe which separates the region of the winter rains from those of the summer rains, and it does not participate in either of them. In the greatest part of this extensive region a drop of rain never falls to refresh the arid soil: and in those districts which approach the countries [illegible] abundant rains, only a few showers occur in Au[illegible] September, and even these not every year. This [illegible] of rain renders the whole region unfit for any kind of [illegible]tion, but not uninhabitable, as the lower depressions [illegible] a few wells, in the vicinity of which the soil is cover[illegible] grass and bushes, that afford pasture to camels, goats, and sheep. These animals supply subsistence to the [illegible] tribes, who wander about in this boundless waste. Travellers who cross this region are exposed to many dangers, both from the nature of the country and from the character of its inhabitants. Though the camels occasionally find some shrubs or grass to satisfy their hunger, no provisions can be got along the whole route, which exceeds 1000 [illegible] length. The traveller must carry everything [illegible]. The wells of drinkable water occur only at a distance of [illegible] days' journey from one another, and sometimes the distance is still greater. The traveller in the desert must therefore provide himself with as much water as is required for his consumption until he reaches the next well; and if the season is drier and hotter than usual, the well is dried up, and he runs imminent risk of perishing of thirst. If he loses his way in the wilderness, a certain death awaits him from hunger and thirst. In those tracts which are covered with fine loose sand, the whirlwinds often blow with great force, and raise a large portion of the sand to a considerable height, and deposit it again at some distance. [illegible]ch pil[illegible] of sand have buried many caffilas. The inhab[illegible] desert lead a wandering life, and, like all nomad[illegible] always ready to attack the traveller, to deprive him of his goods, and to reduce him to slavery. In spite of all [illegible] dangers, the Sahara is annually traversed by seve[illegible] which carry on the commerce between Soodan [illegible] countries on the shores of the Mediterranean.

There is however a track across the desert, in which these dangers are comparatively small. It lies between 13° and 16° E. long., and owes its advantages partly to its climate and partly to its soil. It is remarkable that this track occurs where no elevated country lies between the Mediterra[illegible] and the Sahara, but only the low range of the Ha[illegible] which joins that arm of the Sahara that reaches the s[illegible] of the Mediterranean. The country along the shores o[illegible] gulf of Sidra, between 12° and 19° E. long., and b[illegible] the gulf and the Sahara, does not appear to rise in [illegible] more than 1000 feet, and in most parts it is much [illegible]. Through this wide gap the northern winds, which freque[illegible] blow a gale, and bring moisture from the countries n[illegible] the Mediterranean, which at that season are drenched [illegible] rain, find access to the Sahara, and produce a considera[illegible] degree of cold even as far south as Mourzuk. Horn[illegible] observes that these winds chilled the air to such a [illegible] that not only the natives, but even himself was com[illegible] to have recourse to a fire; and Denham observes t[illegible] thermometer sometimes sinks as low as 41° of Fahr[illegible]. To these winds also we may probably ascribe the rain w[illegible] falls in this season in the kingdom of Fezzan, and [illegible] it the most fertile tract of the Sahara. These [illegible] to extend to 21° N. lat., and as the northern [illegible] tropical rains occurs near 16° N. lat., the tract b[illegible] two limits of rain does not exceed five d[illegible] whilst in other places it occupies more [illegible] extent. The advantages of this tract as a thoro[illegible] caffilas consist in the smaller extent of the sand[illegible] of the continuous or broken ridges of rocks.

parts within the rainless region resemble the sandy
in being without vegetation, the wells which
between them are more numerous, and rarely more
ı few days' journey from one another. The road
h this country gives the easiest access to the interior
ica from the north, and requires a more particular

r leaving the town of Tripoli, the road runs south-east
northern boundary of Fezzan, over a country which
es in some degree of the nature of the Sahara, pre-
g a succession of plains and ridges of hills. The sur-
the plains is in general a firm sand, with a few rocky
ices and patches of gravel. In some spots not a ves-
vegetation appears, and the ground is in no place
tely covered, except in a few small oases, where there
f. The hills are of inconsiderable height, generally
ceeding 400 feet, and never rising above 600 feet.
of them consist of limestone overtopped by lava;
are only sand-hills. They are without vegetation,
ntain between them many fertile valleys. This coun-
ich extends to the town of Sokna in Fezzan, has abun-
f wells and water. The town of Sokna, which contains
1000 inhabitants, is enclosed by walls and surrounded
es of date-trees, the produce of which is of excellent
. South of this place extends the Harutsh Assouat,
s Niger, occupying a width of about 35 miles in a
t line. The lower strata consist of a yellowish lime-
almost entirely composed of marine remains; but
nasses of tabular basalt and irregular precipices
the hills, and extend over all the contiguous plains.
s no vegetation and no water. Travelling is extremely
t, as the hills are furrowed by deep chasms and nar-
vines. Fezzan, which extends from this mountain
the northern tropic, consists of numerous small oases
ed from each other by comparatively narrow tracts
. [Fezzan.] Water is abundant, except towards the
n boundary, where a level desert occurs, which can
traversed in four days; but in the middle of it there
ll place called Gatrone, surrounded by sandy hills and
covered with small trees. The soil of this desert to-
he north consists of a mixture of sand and salt, but
ater part is merely covered with a fine reddish sand.
rowa and Tegerhy there are extensive plantations of
ees and abundance of water. From the southern
ry of Fezzan to the town of Bilma, or from 23° to
N. lat., a continuous ridge of steep rocky hills, ele-
rom 300 to 500 feet above the plain, runs almost due
nd south; and from five to twenty miles east of this
ere are isolated hills, mostly composed of sand, but
places of rock. Between these rocks the road runs
stony plain without the least vegetation, but Denham
at after the rains a grass quickly springs up, which
al feet high, and that the rains fall in torrents as far
Tiggerindumma hills. It would therefore appear
this tract the northern rains extend to 21° N. lat.
t of this country is inhabited, but wells of drinkable
occur at distances of three or four days' journey.
9° N. lat. however there are several small towns or
, which owe their existence not so much to a cer-
gree of fertility in the soil, as to numerous small
hich lie along the foot of the rocky range, and in
trona crystallizes. In the vicinity of some of these
here are groves of date-trees and pasture-ground
tle. In some parts the soil is covered with in-
ions of pure trona, which extend for several miles
y direction. In a few places mimosa-trees are found.
is noted for its extensive salt-pits [Bilma], and
vicinity there are a few spots covered with vege-
South of Bilma is the most difficult portion of
d. It runs over loose hills of fine sand, in which
mels sink nearly knee-deep. The hills sometimes
ar in a single night by the drifting of the sand,
traces of the passage, even of a large caravan,
in a few hours. Wells are rare. After four days'
ng from Bilma, the wells of Dibla are met with,
er four days more, those of Aghadem. The last-men-
wells are abundant, and situated in a wooded valley,
however is not inhabited. After three days more the
y is reached which enjoys a small portion of the tro-
ins, and the soil improves. At first the sandy soil
rspersed with clumps of grass, and here and there
w bushes; trees soon appear, and then increase in

Thus the desert ceases near 16° N. lat., but no permanent habitations are met with until the vicinity of Lari is reached, a town which is situated a short distance from lake Tchad (14° 20′ N. lat.). The desert between Bilma and Lari is called the Desert of Tintuma.

The tract just noticed as traversing the desert from north to south, divides the Sahara into two unequal portions, of which the western and larger is known among the natives by the name of Sahel, and the eastern and smaller among geographers by that of the Libyan Desert.

Coast.—Until lately many misconceptions prevailed respecting this coast, which extends perhaps more than 1200 miles along the Atlantic. It was said that the coast was sandy, and so low that it could only be discovered at a very short distance; that it was lined by extensive sand-banks and shoals; and that the current set perpendicularly towards the shore. It was added that a fog frequently concealed it from the navigator, who was driven towards it by a strong wind which blew directly on the coast. All these circumstances, it was supposed, contributed to the number of shipwrecks which annually occurred on this coast, and threw a great number of Christians into the hands of the Moors who reduced them to slavery. Modern surveys of the shore however have shown that nearly the whole of the coast is elevated, and consists of sandstone, which in most parts rises to the height of 100 feet and more, but in some does not exceed 60 or 80 feet. These cliffs are generally separated from the sea by a narrow beach; but in some places their base is immediately washed by the ocean; and in others sand-hills are observed, which rise gently to a moderate height: at the back the country is generally elevated. A low coast only occurs between cape Mirik (19° N. lat.) and the mouth of the river Senegal, but here also dunes are found at no great distance from the shore, and behind these the flat country seems to have a considerable elevation above the sea. The whole coast as far south as Cape Blanco is free from sand-banks and shoals, and has regular soundings The depth gradually increases from the beach, and at the distance of four miles there are from 30 to 34 fathoms; at twelve miles, from 50 to 60 fathoms; and at the distance of thirty miles, about 100 fathoms. The water then deepens very suddenly. A large sand-bank however extends from Greyhound Bay (21° N. lat.) to Cape Mirik; it is known by the name of the Bank of Arguin, and on it the French frigate Medusa was lost in 1816. As to the currents Lieut Arlett observes that they do not set in towards the land, but run invariably in the direction of the coast, except east of Cape Juby (27° 58′ N. lat. and 12° 55′ W. long.), where the coast turns suddenly from south-west to west; and the current, having hitherto followed the direction of the coast, strikes obliquely on the shore previous to attaining its regular course. This is the most dangerous place in the whole coast-line, as the swell is almost invariably from the north-west, and consequently almost directly on the coast; besides this, the fine particles of sand which cover the desert, being blown into the sea and mingling with the haze occasioned by the heavy surf, render this coast very indistinct. Lieut. Arlett thinks that it would be nearly impossible for a merchant ship embayed here to work off shore. The greatest strength of the current is usually at the distance of three to six miles from the land, and it gradually decreases as it recedes from it. Its average rate from Mogadore to Cape Juby is from one-half to three-quarters of a mile per hour. At Cape Juby it increases to one mile and a quarter per hour, and at Cape Bojador its rate is about one mile. It is however true that the wind almost without exception blows from the north-west or west, and frequently in hard gales, especially in the night. As the trade-winds, which blow from a nearly opposite quarter, prevail in these parts, it is supposed that the rarefaction of the air, produced by the arid soil of the Sahara being heated to an extraordinary degree by the almost perpendicular rays of the sun, gives rise to the westerly winds along the coast of the Sahara.

Soil.—The Sahel, or western part of the desert, is by far the worst part of the Sahara. It does not appear that in all this vast extent a single oasis occurs the soil of which is fit for agriculture or for the growth of date-trees. The soil however varies greatly, passing from a fine to a coarse sand and gravel, and then gradually to a bare layer of broken stones and rocks. In many places hills of moderate elevation occur. Some of them consist of sand, and are subject to be changed in size and form by the winds; others consist of rocks, frequently of granite and quartz. All these soils are destitute of vegetation, which only appears in the depressions between the hills and sometimes at the base of the rocky elevations, but it consists only of a few grasses and shrubs. It would however appear that there must be numerous tracts, though probably of small extent, which are fit for pasture; for according to all accounts, the number of individuals who find subsistence in this part of the Sahara is far from small, and they subsist altogether on the produce of their herds. It is true that the great commercial road which traverses the desert between Drah in Marocco and Timbuctoo in Soodan runs through a country which is incapable of affording subsistence to a single family. It is however stated, and with some degree of probability, that the caravan road has been purposely formed through the worst part of the desert, the merchants being less afraid of the dangers of the country than those which they would have to encounter if they traversed a tract which is inhabited by numerous independent tribes, each of which is eager to enrich itself by plundering the caravans or subjecting them to a heavy tax for a free passage through their territories. It is at least certain that the country along the coast is far from being entirely destitute of inhabitants, as they always make their appearance when a vessel approaches or is cast on the shore. It would also appear that at no great distance from the sea the country contains extensive pasture-grounds though of very inferior quality, and frequently interrupted by tracts which are completely sterile. Farther inland desert tracts entirely destitute of vegetation and inhabitants occupy a much greater portion of the country, but it is perfectly sterile and uninhabited only along the caravan road, so that the caffilas generally terminate their long journey without meeting with a single person. The different tracts covered with sand, gravel, and rocks, as well as the ridges of low hills which occur along the caravan road, run east and west, a fact which may perhaps be accounted for by the circumstance of the wind almost without exception blowing from the east. The country between this road and the above-mentioned country between Tripoli and Lari is less known than the western portion of the Sahel, but the tribes of the Tuaricks which inhabit it appear to be numerous, and to consist of many individuals.

The Libyan desert, or eastern part of the Sahara, contains a considerable number of oases or fertile tracts, which support a moderate population. Nearly all of them contain extensive groves of date-trees and fields in which dhurra is grown. Besides several oases which lie at the distance of two to three days' journey from the valley of the Nile on the west, and which are noticed in the article EGYPT, several others of some extent occur along the caravan route which leads from Dar-Fur north east to Tibesti, but our knowledge of the countries along this road is very imperfect, as no European has ever crossed it. Other oases occur near the northern boundary of the Libyan desert, among which are Siwah and Augila. [AUGILA.]

Climate.—Few European travellers have traversed the Sahara, and we are very imperfectly acquainted with its climate. It is certain that no rain falls along the coast south of Cape Juby, but it is also certain that some showers fall annually in the countries south of Mount Atlas, but it is not known how far inland they extend. These showers fall between August and November. Along the coast heavy dews occur in the summer months, but they appear to be quite unknown in the interior, as Caillié never makes any mention of dew. In the interior the wind blows almost without interruption from the east, and in the day-time frequently with the violence of a gale, which however is generally followed by a dead calm after sunset. The strong wind moderates the heat of the burning sun, and hence the nights are usually more insupportable than the noon-day heat. The violent gales frequently raise the loose sand in such quantities, that a layer of nearly equal portions of sand and air, and rising about twenty feet above the surface of the ground, seems to divide the purer atmosphere from the solid earth. This sand, when agitated by whirlwinds, sometimes buries caffilas, and often puts them into the greatest confusion. 'One of the largest of these pillars of sand,' says Caillié, 'crossed our camp, overset all the tents, and, whirling us about like straws, threw one of us on the other in the utmost confusion. We knew not where we were, and could not distinguish any thing at the distance of a foot. The sand wrapped us in darkness like a fog, and heaven and earth seemed confounded and blended in one. Whilst this frightful tempest lasted, we remained stretched on the ground, motionless, dying of thirst, burned by the heat of the sand, and buffeted by the wind. We suffered nothing however from the sun, whose disc, almost concealed by the cloud of sand, appeared dim and deprived of its rays.' The degree of heat to which these countries are subject has not been determined by exact observation. Da [illegible] briefly states that in the country near Wadi Nun [illegible] at the foot of the Atlas, and contiguous to the Sah[illegible] thermometer in summer at noon varied between [illegible] 140°. Golberry states that at St. Louis on the [illegible] place situated on the southern border of the [illegible] mean temperature of the spring (April, May, [illegible] six o'clock in the morning is 83°, and at noon [illegible] summer (July, August, and September) the [illegible] in the morning generally rises to between 82° [illegible] at noon to 107°. The greatest degree of heat which is experienced in the interior of the Sahara seems to oc[illegible] August and September, at which time caravans do not [illegible] though it is the season in which the northern parts of [illegible] desert are refreshed by showers of rain.

Productions.—The most useful domestic an[illegible] camel, without which these extensive deserts [illegible] be traversed. The camels which are reared by the [illegible] that inhabit the desert are distinguished by their [illegible] dinary speed and abstinence, and known in north[illegible] by the name of *heiries* or *maharkies*. Next to the [illegible] most useful animal is the goat, which is very al[illegible] the Sahel, as the dry pastures are more adapted [illegible] to sheep. Sheep however are also [illegible] some black cattle of a small breed, but only [illegible] which have good pasture. Horses are rare in [illegible] but more numerous farther east. There are li[illegible] thers, and some other smaller wild animals. [illegible] frequent in all places where bushes and shrubs [illegible] in a few places antelopes also are met with. In [illegible] bordering on Egypt the dipus jerboa abounds. In [illegible] ostriches are very numerous, and they are hunted [illegible] natives for their feathers from May to July. Vul[illegible] ravens are the only birds that inhabit the [illegible] some of the lakes along the rocky hills between [illegible] Bilma, where there are snipes and wild ducks. In [illegible] parts the Guinea-fowl occurs. There are also [illegible] in the desert. As honey is used in some districts, it [illegible] seem that bees must be kept, but we find no mention [illegible] them by travellers.

The vegetable productions are few in number. Date-trees are only found in the oases of the eastern districts and at the foot of Mount Atlas. The Tibboos, a native [illegible] the Libyan desert, cultivate *gufsub*, a species of [illegible] and a little cotton. As millet constitutes a part [illegible] daily food of the Moors who inhabit the wes[illegible] of the Sahel, it would seem that this gr[illegible] there; but there is no authority for [illegible] Among the wild plants there are some [illegible] mosas, of acacias, and the *Hedysarum al*[illegible] a plant about eighteen inches high, which remains green the year round, grows in many parts of the desert [illegible] sand, and is eagerly eaten by the camels: it is nearly [illegible] only plant that supplies them with food while they [illegible] traversing the desert. Near the most south-weste[illegible] of the Sahel are extensive woods consisting of ac[illegible] from which by far the greatest part of the gum is [illegible] which in Europe is consumed under the name of g[illegible] It is collected by the Moors, and then sold to [illegible] and English merchants in St. Louis on the banks [illegible] Senegal river.

The minerals are limited to iron-ore and salt. [illegible] occurs between Fezzan and Bilma. Salt is obtain[illegible] springs and lakes, and it occurs also in extensive beds [illegible] Sahel. It is of great importance to the inhab[illegible] furnishes them with the most abundant article of [illegible] The countries south of the Sahara, comprehe[illegible] name of Soodan, appear to have no salt, [illegible] which is consumed in them is brought from [illegible] Sa[illegible] The only places permanently inhabited in the [illegible] those in the neighbourhood of which salt is found.

Inhabitants.—A great number of independent [illegible] dispersed over the Sahara. They belong to f[illegible] the Moors, the Tuaricks, Tibboos, and Arabs. [illegible] seem to be in possession of the whole country [illegible] road leading from Timbuctoo to Drah. They are [illegible] of the Moors who inhabit Marocco, but have a greate[illegible] ture of negro blood in them. Their complexion is [illegible] nearly black, but the red colour under it is [illegible] ir is not woolly, like that of the negroes, but straight; ve a spare body, and rather slender legs; the spine is curved, the face long, the cheeks hollow, the eyes it lively. They speak the Moghrebin dialect of the language, and though they live on the produce of rds, and consequently lead a nomadic life, they take the education of their children, all of whom are reading and some part of the Korân. They are pert in tanning and preparing leather, and in manu- g, with only a hammer and a little anvil, bracelets, , and necklaces of gold, in making knives and and other arms, and they are even expert in weav- lany of them are merchants, and a still greater are employed in accompanying the caffilas on the etween Drah and Timbuctoo. The best known of orish tribes are those in whose territories the gum are situated, and who bring their produce to the in settlements on the Senegal.

numerous tribes of the Tuaricks occupy the centre Sahara, or that country which lies between the at caravan routes that traverse it from north to The form of their body and their language prove ey belong to the aboriginal inhabitants of Northern who are known by the name of Berbers, and in o are called the Amazirghis. They are much stouter e Moors, and their complexion is not so dark. Their aquiline, the eyes large, the mouth finely formed, e long, and the forehead rather elevated. Their e is said to be similar to that of the Amazirghis, but has not yet been well ascertained. They live on duce of their herds and by transporting salt to but they have also compelled some districts of those es to pay them a tribute, as they are very warlike erprising, though their arms are only a lance and a : they never use fire-arms.

Tibboos occupy the tract between Fezzan and Lake and an extensive country extending east of this line the boundary of Egypt. In features they strongly e the negroes. Most of them are quite black, some have copper-coloured faces; they are slim and ide, have high cheek-bones, the negro nose, large and their teeth are much stained by the quantity of and trona which they use. They are above the size. They live principally on the produce of their nd flocks, but also cultivate some millet and cotton. e less warlike than their neighbours the Tuaricks, ch exposed to be pillaged by them where the two live near one another. They are armed like the s.

g the boundary-line of Egypt and Nubia there are rabian tribes, which have preserved the manners and of the Bedouins, and resemble them in every The use of fire-arms, which they have universally , renders them the terror of their more numerous urs the Tibboos, and even of the braver Tuaricks.

nerce.—Though the Sahara only supplies three com- products, salt, gum arabic, and ostrich feathers, a rable traffic is carried on between the countries nd south of the desert, which is frequently traversed as, or caravans, consisting of from 200 to 500 per- d of from 500 to 2000 camels. A camel's load is idred pounds. The caravans export from the coun- uated on the Mediterranean chiefly goods of European cture, such as fire-arms, gunpowder, and some cotton which are added some articles manufactured at l tobacco, dates, &c. Their returns consist of gold, feathers, ivory, and slaves. In traversing the desert ually buy large quantities of salt, which they sell in at a great profit. The road which the caravans tween Tripoli and Bornou has been already noticed. r road, less frequented by caffilas, runs from Tim- northward to Fez. About 150 miles north of Tim- it passes through El Arawan, a place containing 00 houses, and 3000 inhabitants, Moors and Tuaricks. e town there are some good wells, and also some ut nothing is cultivated, and provisions are brought insanding in Bambarra. After leaving that town bited place is met with until the southern declivities Atlas are reached. There are a few wells in the and northern districts through which the road but in those which lie contiguous to El Arawan only one well, which is more than 200 miles from ce. After having reached the southern declivities of the Atlas, the caffila passes through the countries of El Harib, El Drah, and Tafilelt, and then over the elevated range of mountains to Fez. The road which leads from Mogadore to Tarudant or Terodant, and thence to Tatta, is to be considered a branch of this road. From Tatta it takes an eastern direction, and soon falls in with the great caravan line. These two roads are much used. A third road also begins at Timbuctoo or El Arawan, and passes first nearly north until it reaches, near 26° N. lat., the oasis of Touat or Tawat, whence it continues in a north-eastern direction to Gadames, which is on the southern declivity of the hilly region which divides the Sahara from Tripoli. On this road caravans travel eight days without finding a well. A caravan route traverses the Libyan desert, beginning in Soodan at Wara, the capital of the country of Dar-Zaleh or Wadai, and traversing Borgou and Tibesti in a north-western direction. From the last-mentioned place it runs westward to the great road that leads from Bornou to Tripoli. No European has ever travelled along this road. The most eastern caravan road that traverses the Sahara connects Dar-Fur with Egypt: it begins at Cobbe, the commercial town of Dar-Fur, and passing through the small oases of Bir-el-Malha, Leghea, Selimah, and Sheb, it reaches Wady Khargeh, or the Great Oasis (25° N. lat.), whence two roads lead to Egypt, one to the town of Girgeh and the other to Siout. [DAR-FUR.]

Salt is got in great abundance at three places in the Sahel: at Toudeny, which is situated near 21° 30′ N. lat. and 4° W. long.; at Hoden or Waden, near 20° N. lat. and 13° W. long.; and at Shingarin, near 17° 30′ N. lat. and 4° W. long. The town of El Arawan sends the abundant produce of the rock-salt mines of Toudeny to the countries on the banks of the Joliba, especially to Sansanding and Yamina, and receives in return ivory, gold, slaves, wax, honey, cloths of Soodan, and cured provisions. The salt obtained from the rock-salt mines of Hoden and Shingarin is carried to the same places and to Sego by the caravans of the merchants of Walet, a town which is said not to be inferior in extent and population to Timbuctoo, which contains about 12,000 inhabitants. The position of Walet is not well ascertained. According to Mungo Park, it lies between 15° and 16° N. lat. and between 5° and 6° W. long., on the border of the Sahara, and is surrounded by a sterile country. The caravan route from Timbuctoo to Benown in Ludamar passes through Walet.

An extensive fishery is carried on along the coast of the Sahara by the inhabitants of the Canary Islands. This fishery commences on the north at Cape Nun; the fishermen seldom venturing to go farther north, although fish are equally abundant there, from fear of the Moors on that part of the coast, who possess boats. From Cape Nun to the bank of Arguin, which is the extent of the fishery, the inhabitants of the desert have not a single boat. The fish taken here are porgy, mullet of several kinds, rock-cod, and red snapper. The tonnage of the schooners employed in this fishery is from 100 to 150. The fish are very abundant, and weigh from eight to sixty pounds each. Every schooner takes daily on an average three hundredweight. The number of persons employed in this fishery is considerable. It gives employment to between 400 and 500 men from the island of Lanzerote, to about 250 from Fuerteventura, and to a considerable number from the other islands. Fish constitutes the principal food of the poorer inhabitants of the Canaries. The fishermen frequently land, not only to procure water, but to barter their fish with the inhabitants of the desert for wool and orchilla.

Discoveries.—The nature of the Sahara opposes insuperable obstacles to the progress of a conqueror. The Greeks and Romans were only well acquainted with the oases of the Libyan desert, which are at no great distance from the western edge of the valley of the Nile, and with those which are contiguous to the rocky region that divides the desert from the Mediterranean, as the Ammonium (now Siwah), Augila, and Cydamum (now Gadames). The coast of the Sahara was discovered by the Portuguese between 1412 and 1443 [AFRICA, vol. i., p. 174], but the interior of that country was unknown up to the end of the eighteenth century, with the exception of what knowledge might be derived from a few notices in the writings of Leo Africanus. The first impulse to discovery in the interior of Africa was given by the establishment of the African Association in 1788, but before their labours produced any important result, Browne had succeeded (in 1793) in penetrating to Dar-Fur, with the

Soodan caravan, through the oases which lie west of the valley of the Nile. Before he published his Travels (1800), Mungo Park had returned from the banks of the Joliba, where he had collected some information respecting the south-western districts of the Sahara, though he had only been on the borders of the desert. Two years afterwards the travels of Hornemann were published, who had penetrated from Egypt to Fezzan by the way of Siwah and Augila. Though more had thus been done towards discovering the interior of Africa in the last ten years of the eighteenth century than in all previous time, no important addition to our knowledge of the Sahara was made during the next twenty years, except a few facts contained in the narrative of a shipwrecked American sailor named Adams, which was published in 1816. Hornemann indeed is said to have crossed the Sahara, and to have proceeded as far as Nyffe, supposed to be about 10° 30′ N. lat., but no record has been preserved of his journey.

In 1819 Captain Lyon entered Africa from Tripoli, and although he did not add much to our knowledge of the Sahara, as he did not proceed farther than Tegerhy (24° N. lat.) near the southern boundary of Fezzan, he collected much interesting information, which was published in 1821. Denham, Clapperton, and Oudney (1822-1824), following the same route, not only traversed the desert in all its width from Tripoli to Bornou, but discovered a considerable extent of Soodan. These important discoveries were to be enlarged by the travels of Major Laing, who in 1825 likewise departed from Tripoli, and passing through the oasis of Gadames, traversed the whole width of the Sahara, and reached Timbuctoo, but on attempting to return to Marocco by the way of El Arawan, he was murdered by the natives before he reached El Arawan. No record of his travels has has been preserved. Two years afterwards Caillié, a Frenchman, who in 1827 had traversed the southern portion of Senegambia, between 10° and 12° N. lat., and then passed through the western countries of Soodan to Timbuctoo, departed from the last-mentioned place, and reached Fez by the route which is frequented by the caravans that carry on the trade been Soodan and Marocco. A few years ago Davidson made an attempt to reach Timbuctoo by the route from Wady Nun to Tatta, and hence to rejoin the great caravan road, but he was murdered by the natives.

All the nomadic tribes which inhabit the Sahara are independent; but Fezzan and Gadames are subject to Tripoli, and the oases along the western edge of the valley of the Nile, as well as Siwah, depend on the pasha of Egypt.

(Mungo Park's *Travels in the Interior Districts of Africa*; Browne's *Travels in Africa, Egypt, and Syria*; *Journal of F. Hornemann's Travels from Cairo to Mourjouk*; Robert Adams's *Narrative, &c.*; Lyon's *Narrative of Travels in Northern Africa in the years* 1818-1820; Denham, Clapperton, and Oudney's *Narrative of Travels in Northern and Central Africa*; Caillié's *Travels through Central Africa to Timbuctoo*; Golberry's *Travels in Africa*; Savigny's and Corréard's *Narrative of a Voyage to Senegal and the Shipwreck of the Medusa*; Captain Belcher's *Observations on various points of the West Coast of Africa*, in the *London Geogr. Journal*, vol. ii.; Lieut. Arlett's *Survey of some of the Canary Islands and of part of the Western Coast of Africa*, in the *London Geogr. Journal*, vol. vi.; and *Letters from Mr. Davidson*, in the *London Geogr. Journal*, vol. vi. and vol. vii.: Paolo della Cella's *Narrative of an Expedition from Tripoli to the Western Frontier of Egypt*.)

SAHARUNPORE. [SEHARUNPORE.]

SAID IBN BATRIC, the name of a person more commonly known by the appellation of Eutychius (Εὐτύχιος, Arabicè *Eftishious*), which signifies 'Happy' in Greek, as 'Said' does in Arabic. He was born A.H. 263 (A.D. 875), at Fostat in Egypt, and was originally brought up as a physician: and we are told by Ibn Abi Osaibiah (*Oioún Al-Ambá fi Tabacát Al-Atebbá*, 'Fontes Relationum De Classibus Medicorum,' cap. 14, sec. 10) that he excelled both in the theory and practice of that profession, and that he composed a work on the subject of medicine. But it is as an historian that he is best known, and as one of the Melchite* patriarchs of Alexandria, to which dignity he was raise 321 (A.D. 933), and assumed upon the occasion the na Eutychius. He died A.H. 328 (A.D. 940). His p work is a general history of the world, from the cre his own time, written in Arabic, and edited by Oxon., 1656,* 4to. 2 vols., Arab. and Lat., with 'Nadhm Al-Jauáhir: Contextio Gemmarum, sive chii Patriarchæ Alexandrini Annales.' This is styl Gibbon, chap. 51, note m., 'a pompous edition of an ferent author, translated by Pocock to gratify the Pr terian prejudices of his friend Selden,' who defrayed th pense of the work, and promised to add some annota which however his death, in 1654, prevented him fr tributing. He had himself published a small port on same work, entitled 'Eutychii Ægyptii, Patriarchæ O doxorum Alexandrini,—Ecclesiæ suæ Origines,' Arab Lat., Lond. 1642, 4to., with a learned commentary. H lected this particular chapter, because his 'Presbyteria judices' were delighted at finding in it that St. M founding the church at Alexandria, appointed a c twelve presbyters or elders, who, whenever the Patr was vacant, elected one of their own number to office. This little extract of Selden's was very severel ticised in a work entitled 'Eutychius Patriarcha nus vindicatus, et suis restitutus Orientalibus; sive ponsio ad Joannis Seldeni Origines, auctore Abraham chellensi, Maronita ex Libano,' Romæ, 1661, 4to. other smaller works are mentioned in Wüstenfeld, 'G der Arab. Aerzte,' but this only has been published. (and Pusey, 'Catal. MSS. Arab. Biblioth. Bodl.;' D'H 'Biblioth. Orient.;' Schnurrer, 'Biblioth. Arab.,' p

SAIDE. [SYRIA.]

SAÏGA. [ANTELOPE, vol. ii., p. 73.]

SAIL, a quantity of canvas attached to the yards or of a boat or ship in order to receive the impulse of the and thus give motion to the vessel. The depth of a capable of being diminished at pleasure, according force of the wind, by means of the reef-points.

The principal sails of large vessels can be placed at angles to the direction of the keel of the ship, and thu tion is given to them when the vessel goes befor wind; in other cases the same sails may by means braces be placed obliquely to the keel. The sails wh attached to the ship's stays, and the sails of boats or vessels, are generally in a vertical plane passing throu keel; a certain degree of obliquity to that plane may ever be given to them at their lower extremities if sary. Sails are strengthened by cords sewn along edges in order to prevent them from being easily torn action of the wind.

When a vessel is in still water, the pressure of the against the sails overcomes its inertia, and motion place in some direction. The motion goes on increas the accelerative power of the wind, as the motion of scending body is accelerated by the force of gravity; the end of a certain time the resistance in an opposite tion, both of the air against the sails and hull of the sh of the water against the latter, becoming equal to the lerative power of the wind, the ship acquires a term uniform velocity, and in this state (neglecting the res of the air) there may be said to be an equilibrium betwe pressure of the wind against the sails and of the against the vessel.

The principal problem connected with the mot vessels on the water has for its object the determinati the relation between the velocities of the wind and vessel; and its solution consists in finding algebraic e sions for those pressures, and making them equal another. But many practical difficulties present them in investigating that relation; for the pressure of the is modified by the form which the sail assumes when upon, by the obliquity of the wind's direction to the g plane of the sail, and by the interference of one sa another, by which interference the wind may be par tercepted, or currents may be produced in direc ferent from the general direction of the wind. The res of the water is also greatly modified by the form ship's hull and by the direction of its motion with res the line of the keel. These difficulties cannot be rem therefore the results of mathematical researches conc the motion of ships can only be considered as very ıations to the rules which should guide the practice arman. And in o.der to simplify the problem, it is ; to suppose that the ship is furnished with only one se area is such that the action of the wind upon it equivalent to the efficient action of the wind upon ails. The *centre velique*, as it is called by foreign r the centre of pressure, must also be supposed to e centre of gravity of the sail. That part of the ırface which is resisted by the water must more-epresented by a plane surface whose area is such resistance shall be equivalent to the efficient action ıter on the ship.

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* This name, which signifies *Royalists*, was the title applied to the Catholic or Orthodox party in the East, in consequence of the active part taken by the emperors Marcian and Leo in enforcing with arms and edicts the decrees of the Synod of Chalcedon, A.D. 451. 'The name was unknown till the tenth century, and appears to be of Syriac origin. It was invented by the Jacobites, and eagerly adopted by the Nestorians and Mohammedans; but it was accepted without shame by the Catholics, and is frequently used in the Annals of Eutychius.' (Gibbon, chap. 47.)

* Both the [illegible] See and Pusey, 'Catal. MSS. Arab. Bodl. Biblioth.,' pp. 47, and 561.

·essure of the air perpendicularly against a plane qual to one square foot is usually estimated at $\frac{1}{500}$lb. ois, the surface pressed being at rest, and the wind with a velocity equal to one foot per second, or 68 mile per hour; also the resistance of water ı like surface and moving with an equal velocity ted at 1·5 lb. The pressure or resistance, by the hydrodynamics, varies with the square of the and, from the resolution of forces, it may be ıERODYNAMICS] that the effective force with which rikes a plane surface obliquely, when estimated in on perpendicular to the plane, varies with the ' the sine of the inclination to the plane. It must ved however that no dependence can be placed is law; for, from the experiments of Bossut, ıert, and Condorcet, it appears to hold good only ations between 50° and 90°. The experiments of indicate that the pressures vary nearly with the ıe inclination, when the latter is between 50 and 60 at greater inclinations the pressure is some frac-wer of the sine, and at very small inclinations it es nearly to the square. From those of Dr. Hut-ound that at inclinations between 50° and 90° the vary nearly as the sines of the inclinations.

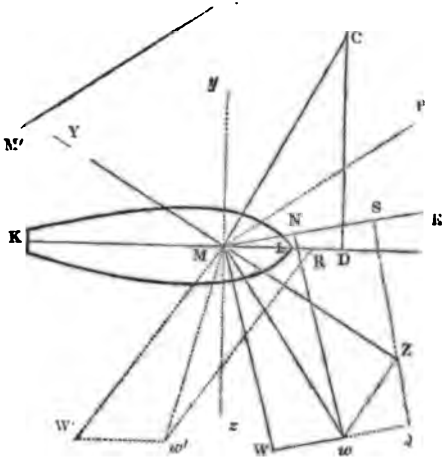
ermining the pressure of a fluid against the sur-ch is in motion, it must be observed that, by the he collision of bodies, the efficient velocity of im-to be expressed not by the absolute, but by the ·elocity of the impelling power. Hence, when the ship are moving in the same direction, the effec-·ity is the difference, and when they are moving in lirections, it is the sum of their several velocities. ılso be observed that the force of the wind and the of the water are to be considered as taking place in .l directions, and that the effective pressure of the a flat sail is in a direction perpendicular to the :he sail, whatever be the position of the latter and tion of the wind.

·hen a ship sails before the wind in still water, if ler the sail as a plane surface at right angles to of the ship and to the direction of the wind; repre-he pressure of the air on a square foot, when the ; one foot per second, by P, and the pressure of the a square foot with an equal velocity by P′; also ' for the velocity of the wind, and V′ for that of the h being expressed in feet per second; A for the ıe sail, and A′ for that of a vertical section through ersed part of the ship taken perpendicularly to the ; equation of equilibrium will evidently be

$$A.\ P.\ (V-V')^2 = A'.\ P'.\ V'^2\,;$$

this equation V′ may be easily found. It follows same equation that, when the other terms are $\frac{V'}{V-V'}$ varies with $\sqrt{A}$, or the velocity of the ıhe sail is to the velocity of the ship as unitv is to ·e root of the surface of the sail.

ıile the plane of the sail is supposed to be perpen-ı the keel of the ship, let the direction of the wind e to both, and let the force of impulse perpendicu-he sail be proportional to the square of the sine clination of the wind to the sail; then, if KL be M the place of the mast, *yz* the position of the ı W′M represent the direction and velocity of the shall have $W'M.^2\ \sin.^2\ W'Mz$ for the force of im-.h which a particle of air acts on the sail. This ıhe impulse is however correct only at the moment e ship begins to move; for, let the ship be advanc-.e direction KL with a velocity such that the sail ırallel to itself from M to R, while a particle of air ove from W′ to M if the ship were at rest,—it will



be evident now that a flag at M, which, when the ship is at rest, would have its plane in the direction W′M produced, being carried by the motion of the ship from M towards L, would be acted on by the particles of air coming against it, as if it were resisted by forces parallel to MR and tending from R towards M; therefore the forces parallel to W′M and RM being respectively proportional to those lines, the flag will by the composition of forces take the direction w′M, the diagonal of the parallelogram W′R. This is the efficient direction of the wind, and its velocity may be represented by that diagonal, when that of the wind in its true direction is represented by W′M: consequently the impulse of the wind perpendicularly to the plane of the sail must be represented by $P.A.\ w'M^2.\ \sin.^2\ w'Mz$. By this impulse motion is produced in the ship in the direction of its keel, and the whole expression may be made equal to $A'.\ P'.\ V'^2$, the former expression for the resistance of the water. The values of W′M and of MR, that is, V and V′, the absolute velocities of the wind and ship, and also the angle LMW′ being known, the value of w′M may be computed.

When the direction of the wind is not coincident with the line of the ship s keel, its power to impel the ship forward will be increased by placing the sail in some oblique position as YZ. In this case let MC, perpendicular to YZ, represent the velocity with which, if not resisted by the water, the ship would move by the action of the wind. Then, by the resolution of motions, letting fall CD perpendicularly on KL, MD and DC will represent the velocities in those directions; and, in the case of equilibrium between the actions of the wind and water, the resistance of the latter against the side of the ship perpendicularly to the keel will be to that against the bow, parallel to the keel, as CD to DM, or as tang. ∠CMD to radius. Let A″ be the area of a vertical section through the immersed part of the ship in the direction of the keel, and A′, as before, the area of the vertical section perpendicularly to the keel; also suppose that, in consequence of the reaction of the water, the ship's motion, instead of being in the direction MC, should be in some other, as ME. Then V′ representing the velocity of the ship in this direction, and the resistance of the water being supposed to be proportional to the square of the velocity and square of the sine of the inclination, we have $P'.A''.V'^2\ \sin.^2$ EMD for the resistance of the water against the ship's side, and $P'.A'.V'^2\ \cos.^2$ EMD for the resistance against the bows. Therefore

$$\tan.\ CMD : \text{radius} :: A''\ \sin.^2\ EMD \cdot A'\ \cos.^2\ EMD;$$

consequently, the ratio of A′ to A″ being supposed to be known, the value of EMD, that is, the ship's lee-way, might be found. If ZMD=45°, and the ratio of A″ to A′ be assumed to be as 12 to 1, the lee-way will be found to be 16° 6′; and if ZMD=30°, the lee-way will be 20° 49′. But experiment alone can determine this element, for, with equal velocities and equal quantities of sail, it varies in different ships; and, in the same ship, with the velocity, and the disposition and quantity of the sail.

Let MN represent the velocity of the ship in the direction ME; then wM, the diagonal of the parallelogram WN, will represent the efficient velocity of the wind in that direction, WM being the true direction of the velocity; and letting fall on YZ the perpendicular wZ, this last line will represent the velocity perpendicularly to the sail. Therefore the force of the wind in this direction will be proportional to wZ^2; then drawing wQ parallel to ME, to meet SQ drawn through Z perpendicularly to ME and wQ, we have ZwQ equal to the compliment of ZME, and consequently wZ^2 being resolved in the direction ME or wQ, becomes wZ^2 cos. ZwQ, or wZ^2 sin. ZME. But wZ varies as sin. $\angle wMZ$; therefore the force of the wind to impel the ship in the direction ME is proportional to $\sin.^2 wMZ$ sin. ZME; and the force of impulse being proportional to the square of the velocity produced by it, it follows that the velocity of the ship will vary with sin. $wMZ \sqrt{\sin. ZME}$. Now making the differential of this expression equal to zero, considering wME as constant and ZME as variable, it will be found that this product is a maximum when $\angle wME$ is so divided that tan. wMZ : tan. ZME :: 2 : 1, or that sin. $(wMZ-ZME)=\frac{1}{3}$ sin. wME.

In Maclaurin's 'Fluxions' (art. 912) there is given an investigation of the angle WMZ, between the true direction of the wind and the plane of the sail, when the velocity of the ship's motion in ME is a maximum. The general expression is complex, but when the direction of the wind is perpendicular to the ship's course we have tan. WMZ$=\sqrt{\left\{2+\frac{9}{4}\frac{V'^2}{V^2}\right\}}+\frac{3}{2}\frac{V'}{V}$; V' being the velocity of the ship and V that of the wind.

Therefore, if the velocity of the ship were very small, we should have tan. WMZ$=\sqrt{2}$ nearly, or WMZ=54° 44′ nearly. But, on making V' equal to ½, ⅓, and ¼ of V, we obtain for $\angle$WMZ the several corresponding values 61° 27′, 63° 26′, and 66° 58′. It may be observed also that, if both $\angle$ZME and V are given, the velocity of the ship will be a maximum when the angle WMZ is a right angle, or when the sails are perpendicular to the true direction of the wind.

In the same work (art. 917) there is given the investigation of an equation from which may be determined the angle ZME, between the plane of the sail and the line of the ship's motion when the velocity is a maximum; and from that equation it is inferred (art. 919) that, if the wind is perpendicular to the sail, the velocity is the greatest (provided the velocity of the ship before the wind be not less than one-third of the velocity of the wind) when sin. ZME : radius :: $(V-1)^{\frac{3}{2}}$: 1·5874; the velocity of the ship being expressed by unity, and V, the true velocity of the wind, by a multiple of that velocity. It may also be inferred from the same equation, that if the velocity of the wind be such as to cause the velocity of the ship to be greater than one-third of itself, the ship will sail faster when the course is oblique to the wind than when coincident with its direction.

The force of the wind, which is denoted by $P.A.wM^2$ $\sin.^2 wMZ$ sin. ZME, being made equal to $P'.A'.V'^2$ (which will express the resistance of the water, if A' represent the area of the immersed section of the ship perpendicularly to ME), the value of V', the velocity of the ship, might from thence be obtained; and from the expression of that value it may be seen that, while the other terms remain the same, the velocity of the ship varies with the relative velocity of the wind and ship, with the sine of its inclination to the plane of the sail, and with the square root of the area of the sail. Hence also, when the velocity of the wind and both the area and position of the sail are constant, the velocity of the ship varies with sin. wMZ; that is, with the sine of the angle made by the apparent direction of the wind with the plane of the sail. It may be inferred from the general equation, that, by sufficiently increasing A and the angle wMZ, the velocity (V') of the ship may be made to exceed wM, which is that of the wind.

If it were required to find the course of the ship and the position of the sails, so that the ship might recede most rapidly from any point of danger, as from a lee-coast situated, for example, in the position indicated by M′P′, at right angles to wM, the direction of the wind; we must imagine MP to be drawn parallel to M′P′, that is, perpendicular to wM. Then, the velocity of the ship in the direction ME being represented by sin. $wMZ\sqrt{\sin. ZME}$, let this velocity be resolved into the direction perpendicular to MP; that is, let it be multiplied by sin. EMP: the ship will recede most rapidly from M′P′ when the expression sin. wMZ. sin. EMP$\sqrt{\sin. ZME}$ is a maximum. On making the differential of this expression equal to zero, we shall find that the velocity perpendicularly to MP is the greatest when $\angle wMP$ is divided so that the tangents of the angles wMZ, ZME, and EMP are to one another as numbers 2, 1, and 2. If the velocity of the ship be [illegible] small, we shall have $\angle wME$, or its equal ZMP, =54° nearly; and $\angle wMZ$ = 35° 16′ nearly. And since [illegible] at right angles from a line M′P′, when that line is p[illegible]dicular to the direction of the wind, is an advance t[illegible] the wind; it follows that the above value of wMZ [illegible]dicate the position which the sail should have with [illegible] to the wind, in order that the ship may get to wi[illegible] with the greatest possible velocity. If the vel[illegible] ship be taken into consideration, the angles [illegible] will, as before, be modified by the relation [illegible] velocities of the ship and wind.

Since the lee-way, which a ship always m[illegible] sails are oblique to the direction of the win[illegible] equality of the reaction of the water which wou[illegible] on the two bows if her movement were in the d[illegible] her keel, and gives rise to an excess of pressure [illegible] lee-bow; it follows that in these circumstan[illegible] head is constantly forced to windward, and [illegible]ency of the ship to turn on the axis of the [illegible] much greater as the bows are more acute. To [illegible] some measure, this tendency, the quantity of sail [illegible] the centre of rotation is greater than that which is [illegible] it; but, notwithstanding such disposition, it alw[illegible] some movement of the rudder to complete the [illegible]tion.

SAILING, or **THE SAILINGS**, a term [illegible] to the different ways in which the path of a ship a[illegible] the variations of its geographical positions are rep[illegible] on paper. It is also applied occasionally to [illegible] which, in particular circumstances, a ship's [illegible] motion are computed.

Plane sailing consists in representing the line of a course or way, for a given time, with the difference be[illegible] the latitudes and between the longitudes of the two ext[illegible] points of such course by the three sides of a right-a[illegible] plane triangle, of which the distance actually sai[illegible] hypotenuse; the spaces on all the lines being e[illegible] nautical miles or equatoreal minutes of a degree, as if [illegible] earth were a plane surface and the terrestrial meridi[illegible] parallels of latitude were straight lines respecti[illegible] to each other.

Middle-latitude sailing and *globular sailing* have [illegible] briefly defined under those words; and the first of [illegible] methods, together with *parallel sailing* and *Mer*[illegible] *sailing*, have been explained under RECKONING AT SEA. The term globular sailing is only a general designation fo[illegible] all those which have been above named, except plane sailing, and it includes also that which is called [illegible] sailing; because in these methods the rules of [illegible] are founded on the hypothesis that the earth is a [illegible].

Great-circle sailing consists in determini[illegible] points in an arc of a great circle between two [illegible] surface of the earth, for the purpose of directi[illegible] course as nearly as possible on such arc; tha[illegible] curve of shortest distance between the place from w[illegible] she sets out and that at which she is to arrive.

If a ship were to sail on the circumference of the e[illegible] or of any meridian, the direction of her course wou[illegible] invariably east and west, or north and south, and the s[illegible] passed over would be differences of longitude or diffe[illegible] latitude merely. If the points of departure and [illegible] in any other direction, the ship's course on the [illegible] circle joining them will, with respect to the points of the [illegible] pass, vary at every moment; and, when great-circle [illegible] attempted, it is usual, for the sake of simplicity, to co[illegible] each portion of the circular arc (the differences of lo[illegible] or latitude between its extremities not exceedi[illegible] five degrees) as coincident with some rhumb [illegible] series of such portions are determined by means of [illegible] latitudes and longitudes of their several extremit[illegible] portions, represented by right lines, may be transfer[illegible] Mercator's chart, on which they will then serve to [illegible] the successive courses which a ship must take in [illegible] it may continue to sail nearly in the required direc[illegible].

The longitudes and latitudes of the points of dep[illegible] and arrival being supposed to be given, the distance be[illegible] those points and also the two angles of position, or [illegible] angles between the meridians of the two points and the great circle joining them, may be computed. Then, if points be assumed on the arc at any convenient equal intervals of longitude, and the latitudes of those points be com uted, the positions of the several portions on the great ircle will be completely determined. In these computations the rules of spherical trigonometry may be employed, ut the operations will be facilitated by the use of the pherical traverse tables, which show, on inspection, the alues of the two terms in the cosine of an angle of a riangle whose three sides are known. (Raper, *Practice f Navigation*, p. 71.)

Traverse sailing is merely a general term for the deter- ation of a single course equivalent to a series of succes- courses, whatever be the manner of finding the lengths he lines forming the triangles.

Oblique sailing consists in determining the position of a hip by observing with a compass the bearings of two or more biects on the shore, whose places are given on a chart, and wing lines from those places so as to make angles h their meridians equal to the observed bearings; the section of the lines gives on the chart the position of ship. This is sometimes called the method of *cross ri s*. The term oblique sailing is also applied to any l in which (when the triangles are not right-angled) ance of the ship from any object on the shore, or of h objects from one another, are computed by the rules trigonometry from bearings observed at the ship the latter is at two or at a greater number of stations.

rent sailing is the method of determining the true on of a ship when, besides being acted upon by the d, she is moving in a current. [RECKONING AT SEA, . 306 col. 2.] Lastly,

W d sailing is a term applied to that mode of ship in which the latter endeavours to gain a ituated in the direction from whence the wind is ing. The ship in this case is made, by frequent ing, to sail as near as possible to the wind.

The use of the compass in enabling the seaman to give to p any required direction, or in ascertaining that the ship is taking when by the force of the wind she beyond his control, is so great as to render it imperative at he should take every opportunity of finding by celestial servations the position of the magnetic needle with respect the terrestrial meridian, that is to say, its declination or tion; and one of the problems of nautical astronomy ists in determining this element, generally by an ob- d altitude of the sun. [AZIMUTH.]

t two circumstances almost constantly operate to render rue course of the ship uncertain. One of these is the *way*, that is, the angular deviation of the ship's line of on from the direction of her keel [SAIL], which direction e is indicated by the compass; and the other is the traction exercised by the iron-work in the ship on the etic needle. By this attraction the needle is prevented taking that direction which it would assume from the t of terrestrial magnetism; and the application of the *recting plate*, by which the local attraction is neutralized, y therefore be with propriety introduced here.

This apparatus, for which the seaman is so much indebted Mr. Barlow, the inventor, consists of two thin circular es of iron, about twelve inches in diameter, between ch is interposed a circular board, in order to increase thickness without much increasing the weight; the es are pressed close together by small screws near their s, and by a screw at each end of a brass socket passing gh the centre. A brass rod about two feet long passes gh this socket perpendicularly to the plate, and is in- d at one end, into the box or stand supporting the ass, the plate being capable of sliding on the rod so as placed at any required distance from a vertical line g through the pivot of the compass.

of the methods put in practice by Mr. Barlow, in to find, on board a ship, the effect of local attraction compass in different directions tending from the latter, o station one observer with a compass or theodolite in convenient situation on shore, and another with a pass on board, at the spot where the ship's compass was permanently fixed. Then (the zeros of the instruments when on shore been brought to coincide with the etic meridian by the observed bearings of some distant ct) while the ship was swinging round as nearly on its tre as possible through 360 degrees, the observers, with ir respective instruments, took by signal each other's ng w n the ship's head tended towards each *point* of ass. It is evident that the two observed bearings, pair, ought, if no cause of error existed, to be diametrically opposite; and the difference between them is due to local attraction in that position of the ship. The direction of the resultant of all the local attractions may then be determined by the composition of forces. The position in which the plate is to be applied to the compass, as a partial corrector of the local attractions, must be found by trial; and, for this purpose, the compass, with its stand or support, is taken on shore, and turned gradually round on its vertical axis. Then, on successively applying and removing the plate, the attraction of the latter must be observed, and such a position found for it that the effects may agree with those which resulted from the experiments on board. When the compass is set up in the ship, the plate must be fixed at a distance from the pivot equal to that which was found on shore, but in an azimuth diametrically opposite to that of the resultant of the local attractions in the ship.

In the 'Phil. Trans,' 1839, Mr. Airy, the astronomer-royal, gave a theory of the magnetism induced by the iron of a ship, in which he has investigated the separate expressions for the disturbing forces or local attractions on the north end of the needle, in directions tending towards the magnetic north, the magnetic east, and vertically downwards. Of these the only force which it is necessary to destroy is the second; and Mr. Airy, having computed the force produced by Barlow's plate when in the position assigned to it as a corrector, combined it with the local attraction towards the east, in order to ascertain what part of the resulting force was really corrected. The result was, that one of the two terms in the expression for the force was destroyed, and that the other was doubled. In order to destroy this term also, in a steam-boat having a compass on the deck or in a cabin, so that the iron work may be nearly equally diffused above and below it, it would be necessary, in addition to Barlow's plate, to have a mass of iron on the same level as the compass, but either on the starboard or larboard side, and in a situation found by trial, so that the compass may point correctly when the ship's head lies north-east, south-east, south-west, and north-west. The compass will then point correctly in all magnetic latitudes.

As a general rule for the application of iron in order to correct the local attractions on ships' compasses, Mr. Airy remarks that if a mass of iron be placed opposite an equal mass, both in azimuth and elevation with respect to the compass, the disturbing effect of one mass is doubled. If one mass be placed opposite the other in azimuth, and at the same elevation or depression, or if it be placed in the same azimuth, but with an elevation instead of a depression, and *vice versâ*, it destroys one term in the disturbing force and doubles another And if one mass be placed on the same level as the compass, its effects may be destroyed by placing another mass at the same level, but at a distance in azimuth equal to 90° on either side.

Instead of an iron plate for the correction of local attractions, Mr. Airy recommends an iron scroll, or a long box containing an iron chain, with one end only directed towards the compass; by this means the inequality of magnetic action in different parts of a broad plate will be avoided.

Mr. Barlow gives the following rule for finding the effect of local attraction on an observed azimuth of the sun:—Take the bearing of the sun by the azimuth compass, or rather, take a mean of several observed bearings in the usual way; first without the correcting plate, and afterwards with the plate attached to the compass; the difference between the two observations, or between the means of the several observations, is due to local attraction. Then if the observations without the plate are diminished by using the plate, the local attraction is to be added to the bearings observed without the plate, in order to give the true bearing or azimuth. If the first observations are increased, the local attraction is to be subtracted.

SAIMA LAKES. [RUSSIAN EMPIRE.]

SAÏMIRI. [SAGOUIN.]

SAINFOIN, *Hedysarum onobrichis*, is a plant of the family of the Leguminosæ, which grows luxuriantly and spontaneously on the calcareous mountains of the middle and south of Europe. It has been in regular cultivation for upwards of two centuries for the purpose of supplying fodder for cattle, either in the green state or when converted into hay. There are few plants which have more rapidly improved the value of poor thin calcareous soils than sainfoin; and in the richer kinds of loam, which contain a considerable proportion of calcareous matter; its value surpasses even that of broad clover, giving fully as great a return, with a much smaller expenditure of manure. The plant has a strong woody and fibrous root, which insinuates itself into the fissures of calcareous rocks, and finds moisture in the dryest seasons, while its spreading fibres keep the earth from being washed down the steep slopes of the hills. Being nearly perennial, or at least of many years duration, it binds the soil together. In favourable situations, it may be made into hay twice in the year, or cut oftener as green fodder. In the most arid and exposed situations, it gives at least one good crop of hay. The plant grows about two feet high, and the stem, which branches out into many compound leaves, is crowned with a beautiful spike of flowers of the papilionaceous kind. After it has been mown, it shoots out rapidly again, and may be advantageously depastured by every kind of cattle or sheep. There are varieties of the plant which differ in the rapidity of their growth: the best is called in France *esparcette* or *sainfoin à deux coupes*. From France it has been introduced into England. The duration of sainfoin depends on the nature of the soil, and the state it was in with respect to weeds when it was sown. A cold wet subsoil soon destroys the roots, whereas a free and dry one, whether rocky or gravelly, gives them vigour. Grass and weeds, which choke the crown of the plant, soon cause it to decay, as is the case with lucern. With every advantage, it may last in vigour ten years, especially if it is occasionally invigorated with a top-dressing of manure or ashes, or, which is best of all, with diluted urine, or the drainings from dunghills. During that time it may be cut twice for hay every year, taking care to cut it before the flower is faded or the seed formed; and if sheep are folded on it after the second cutting, the next crop will well repay the trouble. It is usually sown in spring in a crop of barley or oats, which should be sown thin in order that the sainfoin may not be smothered. The land should have been prepared by a cleansing crop, such as turnips fed off by sheep folded on them. From three to four bushels of seed may be sown, harrowed in, and rolled. It is not often drilled, although this method, by allowing the use of the hoe between the rows, would much strengthen the young plants, and protect them against coarse grasses, which are their greatest enemies. In the first year the sainfoin should not be fed off by sheep; and if it is mown, it should not be mown too close to the ground. The crown of the root in the young plant rises a little above the ground; and if this be bit off, or cut with the scythe, the plant dies. It is useful to harrow the ground lightly, to draw the earth round the roots, and to destroy seed weeds soon after the barley or oats are reaped. The sainfoin does not produce a large crop the first year: for some of the seeds will lie a twelvemonth in the ground before they spring up. It is in perfection after the second year, when a portion may be reserved for seed. Sainfoin hay is extremely nourishing for every kind of cattle, especially if it has been made without rain. Although it is not apt to heat in the stack, it must be put up in a very dry state: and if it has suffered from rain, too much care cannot be taken thoroughly to dry it; for the water insinuates itself by capillary attraction into the hollow stems, and is long in evaporating, so that when it feels quite dry it may yet contain much water. The mode of discovering this is to twist it strongly in the hands into a rope, when the moisture, if there is any, will ooze out. It is better to let it dry thoroughly, than, by carrying it in a hurry, to run the risk of its becoming mouldy within. In very precarious seasons it may be carried in a green state, provided there be no moisture in it from dews or showers, and stacked in alternate layers with good straw. It will impart some of its fragrance to the straw, and lose none of its nutritive qualities. The same may be done with lucern or clover. The most advantageous use of sainfoin however is to cut it green and give it immediately to the cattle. There is no danger of their being hoven by it, for it ferments very slowly, owing to the fibrous nature of the stem. If the situation of the field admits of occasional irrigation, without danger of the water stagnating, the produce of the sainfoin will be greatly increased; and it may then be cut four or even five times in a season without fear of exhausting its strength. When it begins to appear thin on the ground, and other plants seem to get the better of the sainfoin, it is time to break it up. The land will be found much improved in fertility by the sainfoin. A poor chalk or gravel which before would scarcely repay the seed sown in it, will now, by the gradual decay of the roots and fibres of the sainfoin, produce several good crops without any other manure. The prudent farmer however will not entirely destroy, by repeated crops of grain, that cohesion of the soil which is produced by the roots of the sainfoin; but by a judicious course and pro[illegible] application of the manure, which the sainfoin ena[illegible] him to make, he will keep up the newly acquired [illegible]tility until, in the course of ten or twelve years, he again sow sainfoin seed in it with the prospect of a crop [illegible] abundant than the first. Many a poor barren tract [illegible]careous rock and gravel has been fertilised and [illegible] value by the sole effect of the sainfoin, without [illegible] must have remained in its unproductive state.

Although a chalky soil is best adapted to the growth [illegible] sainfoin, it may be sown with advantage in all light lo[illegible] provided the substratum be sound and dry. On very [illegible] deep moulds lucern is a more profitable crop; but sainfoin will thrive where lucern would fail; and it is particularly adapted for poor dry soils.

There is nothing peculiar in the manner in which [illegible] is made into hay. It should not be shaken about t[illegible] for fear of injuring the flower and breaking off the [illegible] The swarth should be merely turned over, when dry on [illegible] side, and then, as soon as it is dry through, it should be [illegible] into small cocks, occasionally spread out in the sun, [illegible] the dew is off the ground, and carried to the stack as s[illegible] it is sufficiently made. It should take a good heat in o[illegible] make it compact, but without acquiring too d[illegible] Experience alone can teach the exact time when it [illegible] stacked. When it is left for seed, it should be [illegible] carefully after the blossom fades. The lower p[illegible] filled with ripe seed before the blossoms at the [illegible] spike of flowers are withered or the seed formed If the sainfoin were left standing till these seeds were [illegible] the lowest would be shed; but by cutting it at a m[illegible] time these may be preserved, while most of the [illegible] ripen in the straw sufficiently to vegetate when sown. Rainy weather is very injurious to the seed crop; a fine time should therefore be selected, if possible, even at the risk of a smaller crop. The seed is only gathered for sowing; but in case there should be more than is required for that purpose, and no ready sale, it is excellent food for horses. The produce varies from three to five or even six sacks per [illegible] It is easily threshed out, and this operation is often done on a cloth in the field, when the weather permits. It is readily done by a threshing-machine, and winnowed like corn. On the whole, there are few plants the cultivation of which is so advantageous as that of sainfoin on the soils on which it thrives best.

SAINT, derived from the Latin 'sanctus' through French 'sainct,' properly signifies a holy or pious [illegible] and is so used in the Christian church. From the commencement of the Christian religion, great veneration [illegible] always shown to persons remarkable for their h[illegible] piety, and their memory was cherished after their [illegible] In course of time it became the custom to implore departed saints to assist the living by their prayers and intercessions with the Deity; and as man has in all ages felt the want of a mediator between himself and the Deity, the practice of praying to saints increased rapidly, and superstition multiplied the number of such mediators to so great an extent, that it was at length found necessary to put some restraint upon the practice. It was accordingly decreed by the ecclesiastical councils in the ninth century, that no departed Christian should be considered as a saint to whom prayers might be addressed, until the bishop in a provincial council, and in the presence of the people, had pronounced him worthy of that honour. Even in that century many divines thought that it was proper that the decisions of bishops and councils should be confirmed by the consent and authority of the pope, who was regarded as the supreme and universal bishop. It was not however till the following century that any person was sainted by the bishop of Rome alone; and this honour was first conferred on Udalric, bishop of Augsburg, by John XV. Shortly afterwards the privilege of declaring departed Christians to be saints was confined to the pope: and the creation of saints was distinguished by the name of 'canonization.'

The invocation of saints in the Roman Catholic church is frequently stigmatised as idolatry; and the church of England condemns the Romish doctrine on the subject as 'a fond thing vainly invented, and grounded upon no warranty of Scripture, but rather repugnant to the word of God.' (Article xxii.) In this, as in any other case of religious

ersy, it is right to take the account of the doctrine
.e persons who believe in it, and not from a statement
r opponents. Thus Bellarmine says, 'It is not law-
sk of the saints to grant to us, as if they were the
of divine benefits, glory, or grace, or the other means
edness. This is proved, first, from Scripture: "The
ill give grace and glory" (*Psalm* 84). Secondly, from
ge of the church; for in the mass prayers and the
offices we never ask anything else but that at their
benefits may be granted to us by God. Thirdly,
ason; for what we need surpasses the power of the
e, and therefore even of saints; therefore we ought
nothing from saints beyond their impetrating from
iat is profitable to us. Fourthly, from Augustine
eodoret, who expressly teach that saints are not to be
l as Gods, but as able to gain from God what they
However, it must be observed, when we say that
; should be asked of saints but their prayers for us,
stion is not about the words, but the sense of the
For, as far as words go, it is lawful to say, "St.
pity me, save me, open for me the gate of heaven;"
give me health of body, patience, fortitude, &c.," pro-
iat we mean "save and pity me by praying for me;"
me this or that by thy prayers and merits." For so
Gregory Nazianzen, and many others of the antients.'
nct. Beat., i. 17.) The doctrine of the Roman Ca-
church is explicitly stated in the council of Trent:
h the church has been accustomed sometimes to
te a few masses to the honour and remembrance of
yet she doth not teach that sacrifice is offered to
but to God alone, who crowned them; wherefore
is the priest wont to say, I offer sacrifice to thee,
r, or O Paul, but to God.' (*Sess.*, 22.)

Lives of the Saints have been written in the 'Acta
um,' 45 vols. fol.; and in Alban Butler's 'Lives of
nts,' 12 vols. 8vo.

NT ANTHONY'S FIRE. [ERYSIPELAS.]

NT EVREMOND. [EVREMOND.]

NT IVES, a municipal and parliamentary borough
county of Cornwall, on the northern coast of the
near its western extremity, 277 miles from London
ingstoke, Andover, Salisbury, Dorchester, Exeter,
ston, Bodmin, Redruth, and St. Erth.

res was originally called St. Iie's, from Iia, 'a woman
sanctity, who came hither from Ireland, about the
0.' In the early part of the sixteenth century it ap-
have suffered much from the encroachment of the
the coast. Leland thus describes the situation of
n and the injury sustained by it from this cause:—
lace that the chief of the toun hath, and partely
tond yn, is a very peninsula, and is extendid into
of Severn as a cape. Moste parte of the houses in
insula be sore oppressid or over-coverid with sandes
stormy windes and rages castith up there. This
e hath continuid ther litle above twenty yeres.' At
sent time a range of sandy downs, covered with a
f, and affording pasturage to sheep, extends along the
rth-eastward from St. Ives nearly to Padstow. Be-
hese downs, which are in some places a mile broad
y or sixty yards above the level of the sea, is found a
le soil, with regular enclosures and remains of houses.
own stands, as described by Leland, partly on a penin-
headland at the north-western extremity of St. Ives
tending inland along the roads to Penzance and to
h. The municipal borough is co-extensive with the
and includes an area of 1850 statute acres, with a
ion, in 1831, of 4776; there were 924 inhabited
41 uninhabited, and 37 building. The houses on
lruth road are well built and roofed with slate. In
arts they are inferior, and the streets are generally
and uneven, neither lighted nor regularly paved.
neral appearance of the town is mean. There are a
ll and a market-house, rebuilt in 1832, and a small
ith two apartments or cells, on the staircase of the
ll. The church is a spacious building, with a lofty
and there are one or two Methodist meeting-houses.
a pier, built above half a century ago by subscription,
uilding, formerly a lighthouse, now used for keeping
nent stores. A breakwater was commenced, at an
of 5000*l.*, but has never been finished. A battery
the approach by sea.

chief business of the place is connected with the
r pilchard fisheries of the neighbourhood. Some ship-building and rope and sail making are carried on. The exports are chiefly pilchards, of which large quantities are cured and sent to Italy and other countries on the shores of the Mediterranean, and tin and copper ore, which are sent to Bristol. There are on the streams near the town several flour-mills and mills for preparing the ores. There are two weekly markets, one of them inconsiderable, and two (antiently four) yearly fairs.

St. Ives was a corporate town in the reign of Philip and Mary, when it first sent representatives to parliament, but the only charter is one of James II., A.D. 1685. Under the Municipal Reform Act the boundary of the borough remained unaltered; but a more contracted one has been recommended by the boundary commissioners, excluding the rural districts of the parish. The corporation consists of four aldermen and twelve councillors, and the borough has a commission of the peace. The Court of Record for the borough, granted by the charter, has not been used in modern times. Petty-sessions are held weekly, and quarter-sessions. By the Parliamentary Reform Act the number of representatives was reduced to one. By the Boundary Act the parishes of Lelant and Towednack, adjacent to the borough, were added to it for parliamentary purposes. The number of voters on the register in 1834-5, was 599; in 1835-6, 504.

The living is a perpetual curacy, of the clear yearly value of 103*l.*, in the archdeaconry of Cornwall and diocese of Exeter.

There were in the parish, in 1833, twelve infant or dame schools, with 145 males and 169 females; seven other day-schools, with 147 males and 110 females; and three Sunday schools, with 264 males and 305 females.

SAINT JOHN, H. [BOLINGBROKE.]

SAINT VITUS'S DANCE. [CHOREA.]

SAINTE CROIX. [STE. CROIX.]

SAINTE MARIE. [STE. MARIE.]

SAINTE MARIE-AUX-MINES. [RHIN, HAUT.]

SAINTES, a town in France, capital of an arrondissement in the department of Charente Inférieure; 254 miles in a direct line south-west of Paris, or 304 miles by the road through Orléans, Tours, Poitiers, Niort, and St. Jean d'Angély; in 45° 44′ N. lat. and 0° 39′ W. long.

This town was known to the Romans by the name of Mediolanum or Mediolanium; and was the chief town of the Santones or Santoni, from whom, in the latter period of the Roman domination, it took the name of Santones, whence by corruption the modern name 'Saintes' has been derived. It is mentioned in the 'Antonine Itinerary,' the 'Theodosian Table,' and the 'Notitia Provinciarum;' and by Strabo, Ptolemy, Ammianus Marcellinus (who speaks of it as one of the most flourishing towns of Aquitania), Ausonius and Sidonius Apollinaris (who call it Santonus and Santoni). There are several Roman remains, especially a large triumphal arch with two archways through it, constructed of enormous stones without cement; the remains of an amphitheatre, almost as large as that of Nîmes, but in a more ruinous condition, of an aqueduct, and of a circus. Several antiquities of minor importance were discovered in 1815 and 1816. On the downfal of the Roman empire, it was occupied successively by the Visigoths and the Franks, and in A.D. 850 was pillaged by the Northmen or Normans. It became the seat of a bishopric in the tenth century, and several ecclesiastical councils were held here. It was the capital of the province of Saintonge, and was, with it, included in the duchy of Guienne; the heiress of which, Eléonore, retired to an abbey here after the dissolution of her marriage with Louis le Jeune. It came, through her subsequent marriage with Henry II., into the hands of the kings of England, who retained it until it was taken from them by Charles V.

The town stands in a pleasant situation at the foot of a hill rising from the left bank of the Charente, over which river is a stone bridge: it has a pleasant appearance at a distance; but the interior does not correspond, for the streets are narrow, crooked, and dirty, and the houses generally ill built. The ex-cathedral is popularly said to have been erected by Charlemagne; it has a fine Gothic steeple. The church of St. Eutrope or Eutropius has also a fine steeple, erected by Louis XI. The buildings of the abbey to which Eléonore retired are now occupied as a cavalry barrack; and the ex-episcopal palace is the hotel of the sub-prefect. The theatre and the college present nothing remarkable in their architecture; in the latter is the public library of 24,000 volumes.

The population of Saintes, in 1826, was 10,300 for the commune; in 1831, 7521 for the town, or 10,437 for the whole commune; and in 1836, 9559 for the commune. The manufactures are of light woollen stuffs, hosiery, and earthenware; there are dye-houses, tan-yards, and cooperages. The town stands in the midst of a rich wine country, and much wine and excellent brandy (Cognac brandy) is produced; these articles, with grain and wool, and the goods manufactured in the town, form the chief articles of trade. There are twelve fairs in the year. There are quarries of excellent stone near the town.

Saintes has a consistorial reformed church; an agricultural society; a departmental nursery; a college or high school, with a cabinet of natural philosophy annexed; a public library, and a museum of natural history. There are some judicial and fiscal offices. From the time of the division of France into departments, to the year 1810, Saintes was the capital of the department, but it has now yielded that dignity to La Rochelle. Its arrondissement had, in 1831, a population of 104,933.

SAINTONGE, a province of France, lying on the coast of the Atlantic. It was bounded on the north-west by the little province of Aunis, from which it was in one part separated by the Charente, on the north-east by Poitou, on the east by Angoumois or Angoumais, on the south and south-west by Le Bordelais or Guyenne Proper, from which it was separated by the Gironde, and on the west by the ocean. It was united with Angoumois into one military government; and the district of Brouageais, which extended along the sea-coast between the Charente and Gironde, was detached from it, and annexed to the government of Aunis, so as to deprive Saintonge of its maritime character.

Saintonge was divided into Haute and Basse, or Upper and Lower, separated from each other by the Charente. Haute or Upper Saintonge, which was south of the Charente, was by far the larger of the two, and comprehended among its subdivisions the districts of Brouageais and the Isle of Arvert, which latter is a peninsula, and not an island, between the little river Seudre and the Gironde. The chief town of Haute Saintonge and of the whole province was Saintes [SAINTES]: among the other towns were Marennes (population 1969 town, 4605 whole commune), Jonzac (population 1798 town, 2618 whole commune) [CHARENTE INFERIEURE], and Barbezieux (population 2437 town, 2756 whole commune) [BARBEZIEUX]. Basse or Lower Saintonge had for its chief town St. Jean d'Angély (population 5326 town, 6031 whole commune) [JEAN D'ANGELY, ST.]. Among the other towns were Tonnay Charente (population 1791 town, 3206 whole commune), and St. Savinien (population 2465 town, 3559 whole commune). [CHARENTE INFERIEURE.] The population of these towns is from the census of 1831. Saintonge is now comprehended in the department of Charente Inférieure, except a very small part which is included in the department of Charente.

The province obtained its name from the Celtic people the Santones or Santoni, by whom, in Cæsar's time, it was inhabited. Under the Romans, it was included in Aquitania; and on the subdivision of that province, in Aquitania Secunda. It fell into the hands successively of the Visigoths and the Franks, and formed part of the duchy of Aquitaine, afterwards Guienne. [SAINTES.]

SAJOU. [SAPAJOU.]

SAKIS. The genus *Pithecia* of Desmarest and Illiger comprehends those American monkeys which are generally known by the name of *Sakis*, or rather those Sakis which have for the most part long and bushy tails, and thus have obtained the name of *Fox-tailed Monkeys*; for the term *Saki*, in its general application, designates any American monkey whose tail is not prehensile.

Pithecia.

Generic Character.—Facial angle, 60 degrees; head round, muzzle short, ears moderate, rounded; canine teeth very strong; tail shorter than the body, not prehensile, and covered with very long hairs; feet pentadactyle, nails claw-like, short and bent; habits nocturnal.

Dental formula:—Incisors $\frac{4}{4}$; canines $\frac{1-1}{1-1}$; molars $\frac{6-6}{6-6}$ = 36.

These *Night monkeys* or *Fox-tailed monkeys* are gregarious.

Examples, *Pithecia Satanas*, *Pithecia Melanocephala*.

Pithecia Satanas.—*Description.*—Colour entirely dusky black, paler beneath, where the hair becomes very t has a purplish tinge which is visible on the face and Hair of the very bushy tail, which is nearly of the l of the body, long and soft. Total length, includ tail, about two feet nine inches.

The hair of the head is thick, and falls over the and the beard is very much developed.

The *female* is rusty brown.

This is the *Cuxio* of Humboldt; *Cebus Satanas*, *Brachyurus Israelita* of Spix.

Locality.—The forests of Brazil; Para, on the Orinoco.

Food.—This species is partial to the fruit of a kn palm; and it is represented in the act of eati Humboldt, from whose figure ours is taken.

Pithecia Satanas.

Pithecia Melanocephala.—Head very round, naked of a dull black colour; its physiognomy reminding the tator of an old negro. The hair of the head directed wards; eyes large and sunk, and the eye-brows com of strong bristles. Nose flat; separation of the no wide. No beard. Ears bare and very large. Body co with yellowish-brown, straight, long, and shining hair the breast, belly, and outsides of the arms are of a hue. Hands black, fingers very long, nails flatt thick, about a sixth shorter than the body, and colour, except at the end, which is black.

Pithecia Melanocephala.

This is the *Simia Melanocephala* and (boldt and Bonpland, also called in America *fso*, *Chacuto*, *Chucuzo*, and *Mono-rubon.*

s just named considered it to be very rare, and only
ı one individual, which they saw in an Indian hut
Francisco Solano; it is well described as being
its congeners what the *Magot* of Barbary is among
-tailed *Macaques*.

ity.—The forests which border the rivers Rio Negro
siquiare.

Habits, &c.—All kinds of fruit are acceptable to
cious *Cacajao*, which is a weak, very inactive, mild-
d, and timid animal. It even shrank from some of
ll *Sapajous*. It trembled violently at the sight of
ile or serpent. When about to seize anything, it
s forth its arms in the manner represented in the
holds the object with difficulty, on account of the
nd slenderness of the fingers. It lives in troops.

ınnot quit this race of monkeys without laying be-
reader Humboldt's graphic account of another
Pithecia Chiropotes, the *Capuchin of the Orinoco*,
very like *Pithecia Satanas*, except in colour, indeed
that an uncoloured figure of the one might well
that of the other. *Pithecia Chiropotes* is brownish
beard is blackish brown, arises below the ears, and
part of the breast. The eyes are sunk and large;
like that of *P. Satanas*, is bushy; the claws are
ept on the thumbs.

oldt says, that of all the monkeys of America, the
n of the Orinoco bears the greatest resemblance in
es to man. The eyes have a mingled expression
ıcholy and ferocity, and the facial angle appears
s than it really is, in consequence of the chin being
d by the long thick beard. Strong, active, and
is very difficult to tame, and when its angry pas-
roused, it raises itself upon its hinder extremities,
s round the aggressor grinding its teeth. It drinks
om; when it does so, the draught is not taken
ng the lips to the liquid, as the other American
do, but the water is taken up in the hollow of
, and carried to the mouth, the head being inclined
oulder. The spectator who would see this action,
performed with great deliberation, must remain
l. If the beard is wetted, the *Capuchin* becomes
nd it is Humboldt's opinion that the method of
above described, has been adopted from the im-
y of applying the lips to the water, in the ordinary
ıout wetting the beard.

ecies is not gregarious; nor is the male often found
ny with the female. Its hoarse and hollow cry is
eard.

AMMONIAC. [AMMONIA.]

. [SWEDEN.]

'CIA, a name applied to a genus of plants of the
ımily of Hippocrateaceæ, which has been so differ-
ned by different botanists, that it sometimes in-
ecies found in Asia, Africa, and America. At
es the American species are referred to the genus
and the African species to the genus Calypso, and
India to the genus Johnia, the last named in
nt to Dr. John, a Danish missionary, who was one
ınders of the Botanic Garden at Tranquebar, and
y new plants to Dr. Roxburgh. The whole are
f species which have little beauty, but the fruit of
species of Johnia is eatable.

DIN. [SALAH-ED-DEEN.]

H-ED-DEEN (*Malek-al-Nasser Salah-ed-deen
haffer Yusef*), better known to European readers
mous name of *Saladin*, was born A.D. 1137 (A.H.
he castle of Tecrit on the Tigris, of which his father
Koord of the tribe of Ravendooz, was governor for
okian sovereign of Persia. Ayub and his brother
subsequently transferred themselves to the service
i, *atabek* of Syria, by whose son, the famous sultan
leen [NOUREDDIN], they were raised to high mili-
urs; and when Shîrakoh (in 1163) was appointed
f the troops designed to reinstate the vizir Shawer
, a subordinate command was entrusted to his
whose disinclination to the service was overruled
press mandate of Noor-ed-deen. In 1166 he again
ied Shîrakoh into Egypt, where his defence of
ia for three months against the superior forces of
ks of Palestine established his military reputation, and gained for him, according to the Christian writers, the honour of knighthood from the king of Jerusalem, Amawry; but the Syrian forces were again compelled to evacuate the country, and it was not till the third expedition (1168) that the subjugation of Egypt was completed. Shîrakoh now became, with the nominal rank of vizir to the Fatimite caliph, viceroy of the kingdom for Noor-ed-deen; but dying the same year, bequeathed his authority to his nephew, who continued to govern Egypt, assisted by the advice and experience of his father Ayub, who had been invited from Damascus to share the prosperity of his son. The last of the Fatimites, Aded Ledini'llah, still bore the title of caliph of Egypt; but even this shadow of schismatic sovereignty was hateful to the bigotry of Noor-ed-deen; and in obedience to his orders, his lieutenant deposed the Fatimite dynasty by a simple ordinance that the *khotbah* or public prayer should be read in the name of the Abbasside caliph Mostadhi; and Aded opportunely dying eleven days after, this important revolution was effected (A.D. 1171, A.H. 567) 'without so much' (in the words of Abulfeda) 'as two goats butting at each other.' The extinction of the Fatimites left Salah-ed-deen virtually sovereign of Egypt; and though in compliance with the prudent counsels of his father he continued to render every external mark of allegiance to Noor-ed-deen, he pertinaciously evaded all the requisitions for military assistance addressed to him by his liege lord, who was preparing to enforce obedience by arms, when Salah-ed-deen was spared the odium of this ungrateful contest by the death of Noor-ed-deen, A.D. 1173, A.H. 569.[*] His heir, Malek-al-Saleh Ismail, a boy eleven years old, was inadequate to the weight of empire: disputes speedily arose among his emirs, and Salah-ed-deen availed himself of the confusion to seize Damascus, which he occupied unopposed (1174). Emesa, Hamah, and other towns dependent on Damascus shared its fate; and when Malek-al-Saleh attempted to regain them by the aid of his cousin Seif-ed-deen Ghazi, atabek of Mosul, the combined forces were routed in two great battles, and Saleh, besieged in Aleppo, was forced to purchase peace by the cession of all southern Syria. Salah-ed-deen now assumed the title of Sultan and all the prerogatives of established royalty, and extended his dominions by the conquest of most of the petty sovereignties on the frontiers of Syria and Mesopotamia. The Ismailis, or Assassins of Lebanon, whose emissaries had attempted his life at the siege of Aleppo, were also chastised and reduced to submission; but in his first encounter with the Franks of Palestine he sustained a disastrous defeat near Ramla from Reginald de Chatillon, Nov. 1177, A.H. 573. The four next years were spent principally in Egypt, the affairs of Syria being conducted by his lieutenants; but in 1182 he quitted Cairo for the last time, and resuming his encroachments on the territories of the atabeks, captured in succession Edessa, Amida, Nisibin, &c.; and though repulsed before Moussoul, succeeded (1183) in possessing himself of the long-coveted city of Aleppo, by a convention with Amad-ed-deen Zenghi II., who had succeeded Malek-al-Saleh. From Yemen to Mount Taurus in Cilicia, and from Tripoli in Africa to the Tigris, the continuity of the rule of Salah-ed-deen was now interrupted only by the Latin kingdom of Jerusalem; and the violation by Reginald de Chatillon of a four years' truce, concluded in 1185, soon afforded a pretext for hostilities. In the famous battle of Hittin, or Tiberias (July 1187, A.H. 583), the Christians, betrayed by the count of Tripoli, were utterly overthrown; the king, Gui de Lusignan, was taken prisoner, and received by the victor with royal generosity; while his partner in captivity, Reginald de Chatillon, was decapitated, as a punishment for his perfidy, by the hand of Salah-ed-deen himself. All the towns of the Frank kingdom, Acre, Beirout, Ascalon, now rapidly fell before the arms of the sultan; and his triumph was crowned by the capture of Jerusalem, which surrendered after a siege of fourteen days (Oct. 2, 1187), after having been 88 years subject to the Franks. The two next years were principally employed in reducing the fragments of the Latin dominion; but Tyre was successfully defended by Conrad of Montferrat, and the appearance of the third Crusade (1189) enabled the Christians again to take the field. The two years' siege of Acre (1189-91) is memorable in the history of the Crusades. The kings of France and England, Philip-Augustus and Richard Cœur-de-Lion, animated by their personal exertions the efforts of the besiegers, while the Moslems, directed by

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lot ('Bibliothèque Orient.' art. *Salaheddin*) erroneously speaks of
d Salah-ed-deen as brothers; but under *Schirgoueh* (Shîrakoh) he
scribes the former as uncle of the latter.

[*] D'Herbelot (art. *Noureddin*) incorrectly states that Noor-ed-deen actually invaded Egypt, and reduced Salah-ed-deen.

the sultan, strove with equal zeal for the relief of the invested fortress: 'never' (in the words of Gibbon) 'did the flame of enthusiasm burn with fiercer and more destructive rage;' but Acre was at length forced to capitulate, and the Crusaders advancing along the coast, took Cæsarea and Jaffa, while Ascalon, after an incessant battle of eleven days during the march, was only saved by being dismantled and rendered untenable.

In the spring of 1192 hostilities were resumed; and the Franks, led by the king of England, penetrated to within a short distance of Jerusalem, where Salah-ed-deen awaited their attack; but the dissensions of the Crusaders occasioned their retreat; and both sides, wearied by the never-ending struggle, were not unwilling to listen to terms of accommodation. The first extraordinary proposal of Richard, that Malek-al-Adel Seif-ed-deen, brother of Salah-ed-deen, should, after embracing Christianity, marry his sister and become king of Jerusalem, though seriously entertained for a time, was ultimately abandoned; and the three years' truce which was concluded, Sept. 1192, A.H. 588, left Jerusalem to the sultan, while the Christians were confirmed in possession of the coast from Jaffa to Tyre. Salah-ed-deen survived only a few months the termination of the war. His constitution was broken by the constant toil to which he had for many years been subjected; and a bilious fever which had seized him at Damascus, carried him off after twelve days' illness, March 4, A.D. 1192, Sefer 29 (Abulfeda; not 27, as stated in the *Art de Verifier les Dates*), A.H. 589, aged 57 lunar years, of which he had reigned more than twenty, reckoning from the death of Noor-ed-deen.

The popular tales of the shroud displayed for a standard, as an emblem of departed greatness, and of the equal distribution of alms among Moslems, Christians, and Jews, are unnoticed by Oriental writers, and are probably fictitious. The character of Salah-ed-deen has been, like that of his predecessor Noor-ed-deen, a favourite theme for eulogy among the writers both of the East and the West. The historian Abulfeda, who was himself descended from a collateral branch of the Ayubite family, and the cadhi Bohadin (whose biography of his sovereign and friend has been rendered familiar by the edition of Schultens, Leyden, 1755), are scarcely more profuse than the Christian chronicles of the Crusades in their panegyrics on the valour, justice, and magnanimity which shone conspicuous in the life and actions of the sultan of Egypt and Syria. His ingratitude to the family of his early benefactor Noor-ed-deen, and the insatiable ambition which led him to despoil so many minor princes of his own faith, are more than atoned for in the eyes of the Orientals by his exploits in the holy war against the Frank invaders of Palestine, and by the rigid justice which he administered impartially to the meanest suppliant for redress; and his generous humanity to the helpless multitude of captives which fell into his hands at the capture of Jerusalem may be favourably contrasted with the massacre of the garrison of Acre, after the capitulation, by the orders of Cœur-de-Lion. The supremacy of his power and virtues was recognised by the voluntary homage of contemporary princes; and Abulfeda relates that on one occasion his stirrup was held by Kaissar-Shah, a Seljookian prince of Anatolia, while Ala-ed-deen, atabek of Moussoul, of the race of Zenghi, arranged his robes after he had mounted. His zeal for the improvement of his territories was attested by the erection of numerous fountains and caravanseras, particularly on the road to Mecca; and the numerous public buildings with which he decorated his first and favourite realm of Egypt, though attributed in the lapse of years, from the similarity of name, to the patriarch Joseph (Yusef), still remain as monuments of his splendor. At the death of Salah-ed-deen, his vast dominions were again divided: the three eldest of his sixteen sons received the kingdoms of Egypt, Damascus, and Aleppo, while the others were provided with appanages under the suzeraintè of their brothers; but discord speedily succeeded, and the dominions of the first-named branches were eventually seized by their uncle Seif-ed-deen (the Saphadin of Christian writers), whose son Malek-al-Kamel was married to the only daughter of Salah-ed-deen. The branch of Aleppo maintained itself longer; and on the extinction of the Ayubites descended from Seif-ed-deen in Egypt and Damascus, by the revolt of the Baharite Mamelukes (A.D. 1250, A.H. 648), the reigning sultan of Aleppo, a great-grandson of Salah-ed-deen, and bearing, like his ancestors, the titles of Malek-al-Nasser Salah-ed-deen Yusef, succeeded in reuniting Damascus to his dominions: [illegible] years later his power was overthrown by the in[illegible] the Moguls from Persia; Malek-al-Nasser s[illegible] their leader Hulagu-khan, and was put to death [illegible] ders (A.D. 1260, A.H. 658), and with him en[illegible] line of Salah-ed-deen.

(Bohadin, *Saladini Vita et Res Gestæ;* [illegible] Abulfaraj; Isfahani; Vinisauf; D'Herbelot; De[illegible] Gibbon; Von Hammer, *History of the Assassins;* [illegible]

SALAMANCA (*Salmantica*), a city of Sp[illegible] capital of the province of that name, is built in [illegible] an amphitheatre on the banks of the Tormes, [illegible] part of its walls. The numerous monastic bui[illegible] old churches give this city so venerable an [illegible] Spaniards of old called it 'Roma la chica' [illegible] (Medina, *Grandezas de España*, f. xcvi.) The ne[illegible] begun by Juan Gil de Hontañon in 1513, [illegible] not finished till 1734, is a magnificent build[illegible] partly Gothic and partly Italian, and orn[illegible] quisite oak carvings and marble sculptu[illegible] latter the most admired are the Adoration of [illegible] which is placed in bold relief over the principal [illegible] the Entrance of Our Saviour into Jerusalem, [illegible] gate. The cathedral is 378 feet in length [illegible] width: the height at the nave is 130 feet. It contains [illegible] good pictures by Blas de Navarrete, surnamed 'El Mudo' (the dumb), Gaspar Becerra, and Juan de Juanes. Close to this is the old cathedral, a very remarkable Gothic building of the 12th century, containing many interesting monuments. In one of its chapels mass is still said according to the Muzarabic ritual. [MUZARAB.] Besides the above, there are in Salamanca twenty-five parish churches, and thirty monasteries of both sexes, now shut up. During the middle ages this city acquired great celebrity by its [illegible] versity, one of the first in Europe. It was [illegible] A.D. 1200 by Alfonso IX. of Leon, and afterwar[illegible] extended by Alfonso X., surnamed 'El Sabio' (the [illegible] so celebrated for the progress which astronomy made [illegible] his auspices, who incorporated with it that of Palencia. [illegible] soon rose into importance, and its professors became [illegible] nent in Europe by their acquaintance with the A[illegible] writers on medicine and philosophy, and through them with the writings of the Greeks. It remained however stationary during the 15th century; and whilst sound science was spreading throughout the rest of Europe, very little [illegible] taught there except medicine and dogmatic theology. [illegible] number of students, which in the 16th century [illegible] to 8000, is now reduced to about 1500. The [illegible] buildings consist of two divisions, separated by a [illegible] There are twenty-five private colleges attached to it, b[illegible] four 'collegios mayores' (superior colleges), so c[illegible] their being designed for the children of the nol[illegible] these the Colegio del Arzobispo and the Col[illegible] del [illegible] which latter is a foundation of Philip II., des[illegible] notice for their size and architecture. The Jesuits [illegible] wise a college, built in 1614; but since their exp[illegible] 1768 it has been divided, and the southern side [illegible] priated to the use of the Irish students.

The city is badly built, with narrow, crooked, and [illegible] streets. It has however some fine squares with orn[illegible] fountains. The principal square (Plaza Mayor), which [illegible] the centre of the city, is a quadrangle surrounded by [illegible] arcade, embellished with marble medallions, repre[illegible] several Spanish heroes, and all the kings of [illegible] Leon, down to Charles III., under whose reign [illegible] was built. Salamanca suffered greatly during the [illegible] sular war, having sustained several sieges, duri[illegible] some of the finest monastic buildings were either c[illegible] destroyed or riddled with cannon-shot. A[illegible] ings which suffered is the Carmelite c[illegible] Herrera, the architect who made the design [illegible] rial. West of Salamanca an engagement took [illegible] 22nd, 1812) between the British under W[illegible] French under Marmont. The French ha[illegible] place on the first attack by the allies; but [illegible] received reinforcements, advanced agains[illegible] and, after various movements, the battle took p[illegible] narrow space between the Tormes and the city. [illegible] commander having imprudently extended his [illegible] far, Wellington took advantage of his error, an[illegible] was defeated with great loss. Marmont hims[illegible] severely wounded that General Clausel was [illegible] the command.

der the Romans, Salamanca was a municipium of the ice of Lusitania. It was the tenth military station en Saragossa and Merida on the road called *Via Lata*, of which remains to the present day in excellent preion. A portion of the Roman wall which formerly inded the city is likewise standing, as well as a colosll and several stones with inscriptions. The splendid on the Tormes, 500 feet long, and resting on 27 , is also attributed to Trajan. The population of anca is computed at 20,000. It has little or no trade: N. lat., 5° 13′ W. long.

LAMANCA. [MEXICAN STATES.]

LAMANDER. [SALAMANDRIDÆ.]

LAMA'NDRIDÆ, a family of Batrachians. The al arrangement of the Salamanders will be found in ticle REPTILES. The genera comprehended under mily by Mr. Bell are *Triton*, Laur. (the ordinary or Newts), and *Lissotriton*, Bell (the smooth Newts); must be remembered that Mr. Bell treats only of the s belonging to these islands.

budi (*Classification der Batrachier*) makes the *Salainæ* consist of the following divisions and genera:—odeles, viz. *Pleurodeles*, Waltl.; *Bradybates*, Tsch.; Salamandræ, viz. *Salamandra*, Linn.; *Pseudosalamandra*, Tsch.; *Ambystoma*, Tsch.; *Onychodactylus*, Tsch.; *Plethodon*, Tsch.; *Cylindrosoma*, Tsch.; *Œdipus*, Tsch.; *Salamandrina*, Fitz.:—Tritones: viz. *Geotriton*, Bonap.; *Hemidactylium*, Tsch.: *Cynops*, Tsch.; *Hynobius*, Tsch.; *Pseudotriton*, Tsch.; *Triton*, Laur.; *Xiphonura*, Tsch:—Tritonides: viz. *Megalobatrachus*, Tsch. (*Sieboldtia*, Bonap.); *Andrias* (fossil), Tsch.; *Menopoma*, Harl.:—Proteideæ: viz. *Siredon*, Wagl. (Axolotl); *Amphiuma*, Gard.; *Menobranchus*, Harl.; *Hypochton*, Merr. (Proteus); and *Siren*.

The Prince of Canino, in his 'Amphibia Europæa ad Systema Nostrum Vertebratorum ordinata,' which gives a valuable arrangement of the European reptiles, makes his family *Salamandridæ* consist of the following subfamilies and genera:—subfam. Pleurodelina: genera, *Pleurodeles; Bradybates*. Subfam. Salamandrina: genera, *Seiranota; Salamandra; Geotriton; Euproctus; Triton*. The *Proteus* is placed in his family *Sirenidæ*, and subfamily *Hypochthonina*.

The following arrangement of the *Batrachians* has just been published (1841) by MM. Duméril and Bibron, in their elaborate *Erpétologie générale*:—

Characters	
	Body, varied in form; skin naked; most frequently without either carapace or scales.
	Head, with two occipital condyles, not carried upon a narrower neck.
	Feet, variable, as regards their presence, their number, their proportion—toes most frequently without claws.
	Sternum, most frequently distinct, never united to the ribs, which are short or null.
	Male organs of generation not projecting; eggs with soft not calcareous shells; young subject to metamorphosis

		Suborders.		Groups.			Families.
ll: body serpentiform		PEROMÈLES		OPHIOSOMES			1. Cæcilioïdes.
ır 'or wo	No tail	ANOURES, with a tongue	Distinct	PHANÉROGLOSSES: with the upper jaw	Toothed: ends of toes	Little or not dilated	2. Raniformes.
						Very dilated	3. Hylæformes.
					Without teeth		4. Bufoniformes.
			Null	PHRYNAGLOSSES			5. Pipæformes.
	A tail	URODÈLES, with a neck	With neither holes nor branchiæ	ARÉTODÈRES			6. Salamandrides
			With slits or distinct holes	TRÉMATODÈRES: with branchiæ		Null	7. Amphiumides.
						Visible and persistent	8. Protéides.

ORGANIZATION OF THE SALAMANDRIDÆ.

eton.—The skull of the terrestrial salamander (*La-alamandra*, Linn.; *Salamandra terrestris*, Aldr. and s well described by Cuvier as being nearly cylindrical, d in front in order to form the semicircular face, and for the two crucial branches resembling those of the and containing the internal ears. But though the sition of the head resembles that of the frogs in the nd under parts, it differs remarkably in other parts: s no girdling bone (os en ceinture), and the only retation of the ethmoid bone appears in a membranous

ve, the cranium is divided nearly equally between the ontal and the two parietal bones. The anterior part frontal bones is articulated forwards with the bones nose; and, laterally, with the anterior frontal bones. ophyses rising from the intermaxillary bones are very which places the external osseous nostrils very far

The nasal bone is placed on the upper part of each n, between the intermaxillary, the frontal, the anterior , and the maxillary bones. The anterior frontal bone s the cheek in front of the anterior angle of the out does not descend into the cavity, the anterior wall h is simply membranous. Cuvier believed that he ery small lachrymal bone at the external angle of the r frontal bone. The dental part of the upper maxillary carried backwards as usual, but without forming a juncth either the pterygoïd or jugal bones. Cuvier found o occipital bones, as in the other batrachians, and each n was intimately united with a part analogous to the *os um* (rocher). A great round hole serves for the entry vestibule, and consequently to the *fenestra ovalis*. living animal it is closed by a cartilaginous plate, it any stem, and entirely hidden under the muscles. s bone, which occupies the place of both the occipital, lateral, and petrous bones, are attached three, the lower of which (the pterygoïd), with its triangular figure, brings to the mind of the observer the three branches of which it is formed in the frogs. Its anterior angle, as has been stated, does not reach the maxillary bone, and is only connected to it by a ligament; neither does the internal angle reach the sphenoïd bone: the external angle exists under the second of the three bones here noticed, viz. the intermediate bone, that to which belongs the facet for the articulation of the jaw. This bone, Cuvier remarks, is very difficult to define; and he further says that he shall perhaps be considered very rash if he names it the jugal bone, for, far from being placed horizontally, and going forwards to join the maxillary, it lies transversely on the posterior border of the pterygoïd bone: nevertheless there is a ligament which unites it to the posterior point of the maxillary bone. The third and upper of these bones lies upon the preceding, and in the same direction; it is oblong and flat, and is attached by its internal extremity upon the lateral occipital bone, without reaching to the parietal. Supposing the jugal bone to be well named, this would be the tympanic bone; and, in fact, if the little plate which covers the *fenestra ovalis* had a handle (manche), it would pass behind the bone of which we speak, as in the frogs it passes behind the tympanic bone.

Below there is only a single sphenoïd bone, which is oblong. Two large triangular bones, which are manifestly analogous to those named *vomers* by Cuvier in the frogs, form the flooring of the nostrils below, and give off each a slender apophysis, which extends backwards under the sphenoïd parallel to its correspondent. It is to these bones and to their apophyses that the two longitudinal rows of the palatal teeth of the Salamanders adhere. Between the anterior part of these bones, behind the intermaxillaries, is a large oval space, which is filled by the membrane of the palate only: their posterior and dentary apophysis extends nearly as far backwards as the sphenoïd bone. Perhaps, observes Cuvier, it is divided at certain periods into two by a suture, and a palatine bone may then be distinguished, but he had not been able to perceive one. There is in the orbit, at its anterior wall, a great membranous space between the maxillary bone, the anterior frontal, and the vomer; and it is at the bottom of this space, and in a notch of the vomer, that the internal nostril is pierced on each side. The bottom of the orbit, on the side of the cranium, between the frontal and parietal bones on one side and the vomer and sphenoïdal bones on the other, is occupied by an oblong bone in which the optic hole is pierced, and which can only answer to the orbital wing of the sphenoïdal bone. It is this part which is membranous in the frogs, and has no existence in the serpents, in which the parietal and frontal bones each supply it by halves: here it is elevated to the state of a particular bone. The two occipital condyles are very much separated from each other, and placed at the two sides of the occipital hole.

The cranium of the European aquatic Salamanders differs in general from that of the terrestrial in having the entire head more oblong, the external nostrils more approximated, the space between the vomers a simple small hole, the pterygoïd bone a mere plate, wide behind and pointed before, &c. They also differ among themselves by sufficiently marked traits. Thus the *Triton Gesneri* has a small hole on the front of the muzzle, between the bones of the nose; and at the frontal, a post-orbital pointed process, very well marked, and directed backwards. The hole becomes a little slit in *Triton Alpestris*, in which the muzzle is shorter, and the post-orbital apophysis smaller and more transverse. In the *Triton cristatus* the post-orbital apophysis is but little marked, and the singularly rugose anterior region of the cranium has but a simple pit in lieu of a hole. In *Tritones punctatus* and *palmatus* the post-orbital apophysis is even longer than it is in *Triton Gesneri*, and on the front of the cranium are two slightly projecting lines, which unite forwards in the shape of a Y. In the Great Salamander of the Alleghanies, the *Hellbender* of the Americans (*Menopoma gigantea*), the principal frontal and anterior bones are narrower and more elongated. The first penetrate pointedly backwards between the parietal bones; forwards they extend to the external aperture of the nostrils. The nasal bones touch each other between them, and are placed between the frontal bones, the intermaxillaries, and the apertures of the nostrils. The orbital wings are but little elevated, pierced with very small optic holes, and leaving between them and the *ossa petrosa* a membranous space. The *ossa petrosa* are very distinct from the lateral occipital bones, and are entirely separated from them by a cartilage, in which the *fenestra ovalis* is pierced. The pterygoïd bones are very wide, and are articulated by one of their sides to nearly the whole of the external border of the sphenoïdal bone, which last is very much flattened and very wide: the two vomers carry their teeth not longitudinally, but transversely, on their anterior border, and parallel to the intermaxillary and maxillary teeth. Cuvier remarks further that the head of the aquatic Salamanders in the larva state offers differences which deserve to be better studied than he had been enabled to do in the midst of so many occupations. Thus, he observes, the bones which he has named vomers are less fixed at the base of the nostrils: and instead of a single row of teeth, they have their whole surface furnished with them, an observation of Signor Rusconi which Cuvier verified. The ascending apophyses of the intermaxillaries are longer and narrower, the maxillary bones are less developed, &c., circumstances all of which are found in the *Axolotl*, and of which traces are to be seen even in the *Siren*. The Salamanders have a true dental lower jaw, forming a symphysis with its congener, and carrying teeth nearly as in the generality of lizards. The rest is composed, in the ordinary adult Salamanders, of a single piece, which doubles the preceding at the posterior half of its internal surface, forms a coronoïd crest, a prominence backwards, and carries the articular tubercle, which is intimately soldered to it. In the Great American Salamander this second bone is itself divided into two portions, viz. a coronoïd and an articular portion. (*Ossemens fossiles.*)

Professor Owen, in his elaborate and excellent 'Odontography,' has a most interesting chapter on the *Teeth of Batrachians*. He remarks that the variations which the dental system presents in the Batrachian order of Reptiles are more conspicuous in the number, situation, and [illegible]ture of the teeth, than in their form or mode of a[illegible] Certain Batrachians, he observes, are edentul[illegible] *Hylaplesia* among the tree-frogs, for example, and [illegible] *fonidæ*, or Toad family, with the exception of [illegible] of *Bombinator*. The teeth when p[illegible] him as generally numerous, simple, [illegible] and close-set, either in a single row or agg[illegible] teeth of a rasp, and he points out a characte[illegible] of the dental system in fishes, namely, the ab[illegible] on the superior maxillary bone, as being contin[illegible] genera of perennibranchiate Batrachians which [illegible] in the class of Reptiles; not only the superior [illegible] teeth, but the bones themselves are absent, [illegible] *Siren*, *Menobranchus*, and *Proteus*. In [illegible] describes the lower margin of the intermaxill[illegible] the sloping anterior and upper margin of [illegible] as trenchant, and each encased in a sheath of [illegible]minous, minutely fibrous tissue, harder than [illegible] bones thus armed slide upon each other, [illegible] the blades of a pair of curved scissors, when [illegible] closed, and are well adapted for dividing the b[illegible] fish, aquatic larvæ, worms, &c. The horny [illegible] teeth in the lower jaw is supported by the [illegible] corresponding with the premandibular of the [illegible] [PROTOPTERUS.] A second bony piece applied [illegible] surface of the branch of the jaw (repre[illegible] or opercular element in the jaw of the [illegible] with numerous minute pointed teeth, set in [illegible] rows, and directed obliquely backwards. [illegible] face of the mouth is described as presenti[illegible] two flat, thin, and moderately broad bones, [illegible] parently single, oblique, oval plate, which conver[illegible] its fellow at the anterior part of the palate, so [illegible] to constitute a broad rasp-like surface in [illegible] chevron. The Professor regards the anterior [illegible] each side as the representative of the divided v[illegible] it supports six or seven oblique rows of small p[illegible] verted teeth; the smaller posterior plate, which [illegible] may probably be the homologue of the pterygoïd, with four rows of similar teeth; and thus we have eleven rows on each side of the chevron of the palate. [illegible] greatest number of denticles (11 or 12) is in [illegible] rows; in the anterior and posterior rows they are [illegible] are of similar size and form, corresponding with [illegible] the lower jaw opposed to them. 'The c[illegible] dental system in this, the lowest of the cl[illegible] says Mr. Owen, 'is not without interest. [illegible] of the absence of the superior maxill[illegible] teeth, the presence of the palatal and inferior [illegible] en carde." If, for example, the dense [illegible] chant anterior parts of the upper and lo[illegible] been completely calcified and converted into [illegible] the correspondence between the siren and t[illegible] would have been very striking in this part of t[illegible]ture; but the maxillary sheaths of the siren [illegible]posed of horn, and being moreover easily det[illegible] the subjacent bones, much more closely re[illegible] deciduous mandibles of the tadpoles of the [illegible]trachians.' (Part ii., pp. 188, 189.)

In the AXOLOTL also Professor Owen notices the character of the rasp-like teeth aggregated in [illegible] rows upon the palatal region of the mouth, an[illegible] splenial or opercular element of the lower jaw: [illegible] he observes, the superior maxillary bones are de[illegible] support teeth. The premandibular and the in[illegible] bones, he adds, instead of presenting the lar[illegible] the horny sheath, have their alveolar borde[illegible] single row of small, equal, fine, and sharp-poi[illegible] which are continued above along the maxillaries; [illegible] observes, establishing the commencement of the [illegible] batrachian condition of the marginal teeth of the [illegible] cavity. As in the siren, the dentigerous bones [illegible] palate consist of two plates on each side; the anter[illegible] or vomers, converge and meet at their anterior extr[illegible] and the minute denticles which they support [illegible] quincuncially; the posterior pair of bones con[illegible]wards, according to the usual disposition of the [illegible]goïds, abut against the tympanic or quadrate [illegible] the denticles are confined to the anterior part [illegible] surface, resembling, in their arrangement and [illegible] attachment, those of the palatal series, of which th[illegible] the posterior termination.

The superior maxillaries and their teeth are, it appears, wanting in *Menobranchus* [NECTURUS]; but Professor Owen erves, that in this form an advance to a higher type of ition is perceptible by the arrangement of the teeth in single row both upon the roof and at the margins of the uth. The intermaxillary bones are produced backwards, he single row of small pointed teeth which they suppposed to a similar series upon the premandibular below. The palatal teeth form a single row on each he broad bones which correspond with those described y Cuvier as the divided vomer in the higher Batrachians, nd extend backwards upon the pterygoids, which support few teeth.

The three preceding genera are perennibranchiate, and hough the PROTEUS, like them, always retains its exal gills, Professor Owen remarks that it offers a furr advance to the dentition of the higher Batrachians, and to that of the *Amphiuma* especially. Each interxillary bone carries on its alveolar border a row of eight r ten minute, fine, sharp-pointed teeth, and each premandibular bone is armed with a greater number of similar but er teeth, arranged also in single series. The palatine nes (two vomers of Cuvier) support a row of denticles, ilar to the intermaxillary crescentic series and parallel them; but Mr. Owen points out that the horns of the palatal dental crescent are continued much farther back, terminating, as in Menobranchus, on the anterior of the pterygoid bones. Twenty-four teeth are cond in each half of the 'crescentic or chevron-shaped es,' as the arrangement is appropriately designated by Professor, who adds that the superior maxillary bones represented in this form by mere cartilaginous rudints.

Professor Owen next notices the AMPHIUMA, which, he es, like the Proteus, presents the batrachian disposi n of the teeth in a single close-set series along the alveo border of both upper and lower jaws. 'The upper series,' he observes, 'extends along well-developed maxilary and intermaxillary bones, and in the extent of the illary and palatal series, especially in *Amphiuma tridacm*, the indication of a highly interesting character in red to the affinities of an extinct race of gigantic Batraians with biconcave vertebræ is discernible. [SALAMANROÏDES.]

In the Amphiuma the palatal teeth run in a single closerow along the lateral margins of the vomer, forming an ite angle at its anterior portion, whence the series is exuded backwards on either side nearly longitudinally, and arallel with the maxillary teeth. 'All the teeth are conical, ointed, slightly curved backwards and inwards; their ints glisten with a yellow metallic lustre,' whence Dr. tchell's name *Chrysodonta*. The number of teeth in *phiuma means* is, Professor Owen informs us, considerless than in *Amphiuma tridactylum*.

now approach a most interesting part of the inquiry l rative of a fossil that has made some noise in the orld, but which is now justly degraded to its proper place the scale of animals, and is not a whit less interesting r such degradation. 'The Menopome exhibits,' says Prossor Owen, 'the same essentially batrachian condition of the a as the Amphiume; but in their disposition, and in the ion and form of the vomer, it makes a near approach the caducibranchiate group, and allies itself most closely ith the gigantic newt of Japan (*Sieboldtia*, Bonap.), and ith that equally gigantic extinct species of Newt so noted palæontology as the *Homo diluvii testis* of Scheuchzer. In persistence of the branchial apertures, and the more plex structure of the *os hyoïdes*, the Menopome hower manifests its generic distinctness from the Sieboldtia. he single close-set series of small, equal, conical, and tly recurved teeth describes a semicircle on both the pper and lower jaws: the row of similar but smaller teeth n the anterior expanded border of the divided vomer runs llel with and at a short distance behind the median art of the maxillary series. The premandibular teeth are eived into the narrow interspace between the two rows in upper jaw when the mouth is closed. The teeth of the nopome, as of the Amphiume, are anchylosed by their ase and part of its outer side to a slightly elevated external alveolar ridge.

'*Sieboldtia.*—The perennibranchiate or fish-like Batrans, "doubtful reptiles," as they have been termed, lead so easy a series of transitions to the caducibranchiate group, in which all external trace of the branchial apparatus is lost, that the artificial nature of such a division of the order is evident, and some naturalists have even hesitated whether to separate, generically, the last of the perennibranchians from the species *Sieboldtia gigantea*, with which the description of the dental system in the higher division of the Batrachians is here commenced. As regards the teeth, the difference between the great aquatic salamander of the volcanic mountains of Japan and that of the Alleghanies is very slight, and merely specific; the form, disposition, and attachment of the teeth are the same in *Sieboldtia* as in *Menopoma;* they differ slightly in relative size, those of the Japanese newt having the advantage in this respect, with a somewhat deeper implantation of their anchylosed base, and the alveolar parapet of the intermaxillary bones is higher and is slightly incurved. There are fourteen teeth in each intermaxillary, seventy-two in each superior maxillary, and sixty-four teeth in each vomer of the *Sieboldtia gigantea*.'

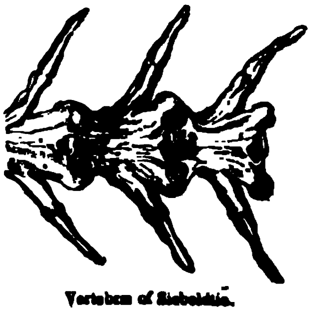
Professor Owen then points out that the disposition, form, and attachment of the teeth in the great fossil newt or salamander (*Andrias Scheuchzeri*, Tschud.) are the same as in the Menopome and Sieboldtia, but that they appear to have been relatively smaller than in the latter genus; and perhaps less compressed, and with more conspicuous basal grooves.

The Professor further remarks that all the caducibranchiate Batrachians with tails, as the newts and land salamanders, have teeth on the inferior maxillary and vomerine bones, as well as on the intermaxillaries and superior maxillaries. In the common newts (*Tritones palustris, cristatus*, and other allied species of the old world) the teeth are, he observes, confined to the bones above mentioned; they are, he informs us, equal, subcompressed, fine, sharp-pointed cones, arranged in a single close-set row, along the upper and lower margins of the mouth, and extending far back upon the roof of the mouth, in a single row along the outer margins of each vomer, the vomerine teeth being extremely minute. But it further appears, according to the same author, that most of the North American newts have a fourth locality for teeth, reminding the observer of a peculiarity in the dental system of some of the highly organised clupeoïd fishes of the South American rivers, viz. upon the under surface of the sphenoïd bone. Four rows of these sphenoïd teeth are found in the subgenus *Pseudotriton;* and in *Salamandra glutinosa*, Maclure (*Plethodon*, Tschud.), they are, Professor Owen informs us, aggregated *en brosse* to the number of three hundred and upwards, upon both the basi-sphenoïd and basi-occipital bones; a single row is set nearly across the posterior margin of each vomer, and the marginal teeth of the mouth, maxillary and intermaxillary, are arranged in a single series both above and below.

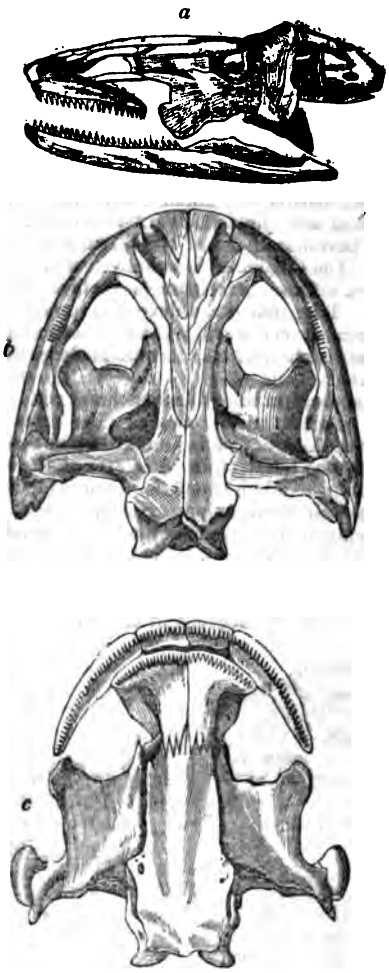
For a particular account of the teeth of the *Ranidæ* we must refer the reader to the work itself, observing here only that the frogs have no teeth on the lower jaw, though in some species (*Ceratophrys* for example) the alveolar edge of the lower jaw-bone is finely notched or dentated. The *Bufonidæ*, as a general rule, are toothless, but in the *Bombinatores* the subgenus *Hyladactylus* has teeth upon the vomer, and *Sclerophrys* has teeth on both the intermaxillary and maxillary bones. Professor Owen remarks that in microscopic structure the teeth of the existing Batrachians, like those of most Saurians, correspond with the simple mammalian teeth, and, after an elaborate description of the microscopic appearances in the tooth of a frog, proceeds to the description of the dental system in the extinct genus *Labyrinthodon*, which will be noticed in this work under the title SALAMANDROÏDES.

Thus we are indebted to Professor Owen for a most able exposition of the dentition of the Batrachians generally, showing the gradation by which that order of reptiles is linked to the fishes on the one hand and the Saurians on the other, and the various stages of development by which the Batrachians are connected with each other. (*Odontography*)

To return to the salamander, we find, as indeed might be expected from the metamorphosis which it undergoes, that its os hyoïdes is subject to changes analogous to those of the frog, though not so complete. In its larva state it has, Cuvier observes, two hyoïdian branches springing from the occipital bones, uniting forwards under the lower jaw, and a cartilaginous branchial apparatus suspended at the point of union of those branches, and supporting four arches on each side, the first of which is attached to an intermediate stem, the three following to a second two-jointed stem, and these two pairs of stem to an unequal branch, as is more clearly manifested in the axolotl. The adult aquatic salamanders preserve in the bony state the branches which still are attached below the fenestra ovalis, and terminate forward by a truncation under the middle of the lower jaw; but the anterior articulation of these branches is now become membranous. The unequal stem, in the bony state, supports on each side an osseous branch consisting of two joints, terminated by a cartilaginous point, and moreover, internally, another branch which is simple and reduced to a filament, which goes from the unequal stem to the second articulation of the external branch. In the terrestrial salamander, which can only pass a very short time in the larva state, all remains cartilaginous. The two suspensive branches or anterior horns are delicate and flat, and do not join the cranium; and the unequal stem with its two branches soldered on each side by their two ends, forms only a single chevron-shaped cartilage, each branch of which is pierced with a considerable gap. This remainder or vestige of the branchial apparatus does not prevent the co-existence of a larynx and the rudiment of a sternum; both indeed weak and membranous rather than cartilaginous. The shoulder of the salamander is, Cuvier remarks, very curious on account of the close junction of its three bones into a single one, which has the glenoïd fosset at its anterior edge, sends towards the spine a square lobe slightly enlarged above, which is the omoplate, and towards the breast a rounded disk, slightly lobated, which is composed of the clavicle and coracoïd bone, where a suture which separates them may for a long time be observed, and where there always remains a small hole. The omoplate has its spinal edge augmented by a cartilaginous prolongation. The cleido-coracoïd is also surrounded with a great cartilaginous blade in form of a crescent, which crosses upon its congener under the breast, for the only vestige of a sternum remaining is a cartilaginous blade placed behind the two preceding, and which represents the xiphoïd. The atlas of the salamander is articulated with the head by two concave facets, and with the second vertebra by the face of its body, which is also concave; for, contrary to the case of the frogs and lizards, all the anterior faces of the bodies of the vertebræ are convex in the salamanders, and all the posterior faces concave; the upper part is flat. The articular apophyses are horizontal, and united on each side by a crest, which, joined to that of the other side, gives to the vertebra a sort of roof which is rectangular, but with its lateral borders a little re-entering. The posterior parts of a vertebra lie on the anterior parts of that which follows it. In lieu of spinous apophyses, there is only a slight appearance of a longitudinal ridge. The body of the vertebra, which is cylindrical and narrowed in its middle, adheres under the roof above noticed. The transverse apophyses also adhere under the lateral crests, are directed slightly backwards, and divided by a furrow on each of their faces, so that their extremity has as it were two tubercles for carrying those into which the base of the small rib is divided. These small ribs adjoin all the cervical, dorsal, and lumbar vertebræ, except the atlas, but are only two or three lines in length, and are far from surrounding the trunk or reaching the sternum. Among the aquatic salamanders, the *Triton Gesneri* has the crest of the dorsal vertebræ more elevated and sharp than the terrestrial salamander; this crest is also rather more developed in *Triton Alpestris* and even in *Tritones punctatus* and *palmatus*; but what, adds Cuvier, is very singular, it is precisely in *Triton cristatus* that this crest is most effaced, and the upper part of the vertebra nearly plain. The vertebræ of the tail (25 or 26 in number) in the terrestrial salamander have crests and tranverse apophyses like those of the back; they become smaller and smaller, and, counting from the third caudal, there is under the body a transverse blade directed obliquely backwards, pierced with a hole at its base, which represents the chevron bones of the lizards and the other long-tailed genera. Cuvier counted 33 caudal vertebræ in the *Tritones alpestris* and *cristatus*, 34 in *Triton Gesneri*, and 36 in *Triton punctatus*. They form, he observes, a tail flattened laterally, in consequence of the elevation of their upper and lower crests. The bones of the limbs are, says Cuvier in continuation, proportioned to the smallness of the members themselves. The humerus has, above, a round head; a little lower, forwards, there is a compressed and obtuse tuberosity; and backwards, a little lower still, another very pointed one. Its lower head is flattened from before bark and widened to suit the condyles, between which is a cular head, rounded for the fore-arm, and above, forw small fosset. The aquatic salamander has this bon widened above than the terrestrial species. The fo is composed of two separate bones. The radius has a upper head, a narrowed body, and a compressed and w lower head. The cubit is more equal in size, and cranon is very short and rounded. The carpus bones and two cartilages, which occupy the place [illegible] seven pieces in all: the whole of these are flat [illegible] posed in a pavement-like order, and in s[illegible] nounce the structure to be seen in the [illegible] the first rank are two, of which the smallest [illegible] tilaginous. The greatest belongs to the [illegible] between them on the second rank is a [illegible] come, on the third rank, four for [illegible] remains cartilaginous. The m[illegible]arpals [illegible] narrowed in their middle. Cu[illegible] found [illegible] ossified on the first finger, two [illegible] the se[illegible] and three on the third. The variety [illegible] pelvis is attached to the spine is, he [illegible] a very thing. He had individuals of the te[illegible]ial salam[illegible] which it was suspended from the fifteenth vertebra (c in the atlas), and others in which it was suspended fr sixteenth; and he refers to a specimen (species u mined) seen by M. Schultze, in which it was [illegible] one side to the sixteenth vertebra, and on t[illegible] other seventeenth. With regard to the aquatic salam Cuvier found it constantly suspended to the fourtee *Tritones palmatus* and *alpestris*, to the fifteenth in T *punctatus* and *Gesneri*, and to the seventeenth or eigh in *Triton cristatus*. He had an individual of th named species, in which it was suspended on one side seventeenth vertebra, and on the other to the eight The pelvis itself is quite differently formed from that frogs: the vertebra which supports it is like those precede it, and has, like them, on each side a small the extremity of which the os ilii is suspended by a lig It is cylindrical, and widens a little on arriving at th loïd cavity. The pubis and ischium are soldered and form, with those of the other side, from which [illegible] distinct, a large disk, concave above, flat below, cut sq front and at the anterior parts of the sides, notched and narrowed behind the cotyloïd fossæ, and te backwards in a concave arch. The pubis [illegible] ginous much longer than the ischium, with wh[illegible] by a suture which makes a cross with the symph in front of this symphysis is a cartilage in the form in the muscles, which recalls to the observer the ma bones of the opossums. The upper head of the f oval; at the internal face of the neck, there is a very apophysis, occupying the place of a trochanter: [illegible] head is widened and flattened from before [illegible] There are two bones in the leg. The tibia, [illegible] stout upwards, has in front a ridge, which de[illegible] from the upper part of the bone in the form of a [illegible] stem, resembling the vestige of a fibula discern[illegible] Rodents, but this does not prevent the deve[illegible] true fibula as large as the tibia, and which desce[illegible] lower. There are nine tarsal bones, all flat and [illegible] a pavement-like order: the lower rank has five [illegible] metatarsal bones; the four others consist of one [illegible] tibial) at the internal border, one great (the [illegible] external border, an oblong one between t[illegible] liquely and answering to the tibia and [illegible] square in the middle of all the others. Cu[illegible] one phalanx on the first finger, two on the sec the third and fourth, and two on the last.



Vertebræ of Sieboldia.

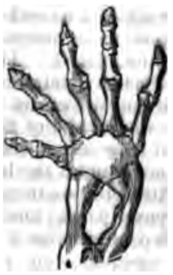


Menopoma. *a*, seen in profile; *b*, seen from above; *c*, cranium below.

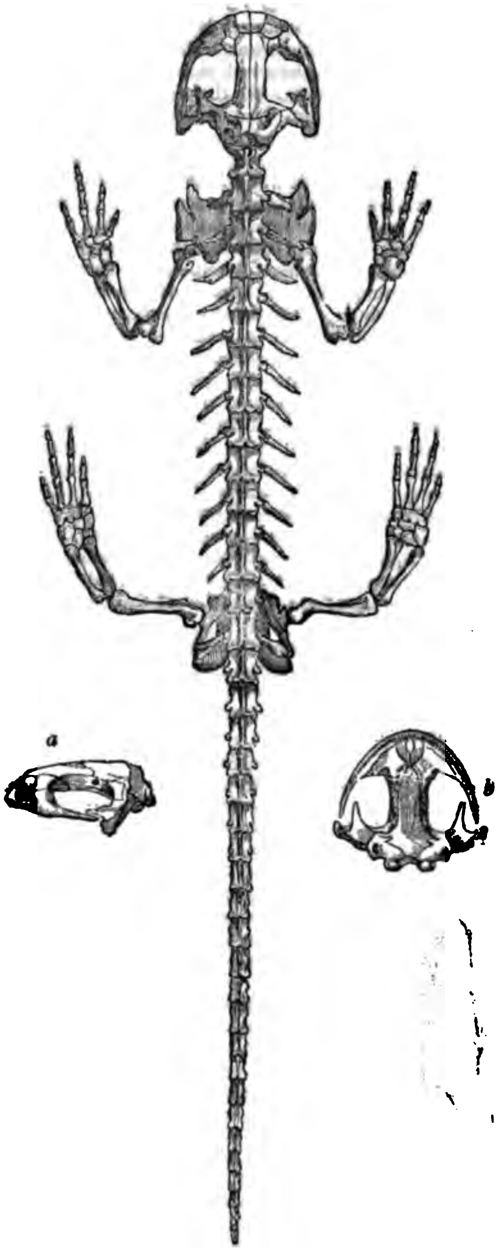
Skull of Sieboldtia, seen from below.

ttion.—Such particulars of the generation of the *lridæ* as require notice will be found under the he genera treated of in this article.

'uction.—The power of reproducing excised or in- :ts has been observed in no family among the ore carefully than in the *Salamandridæ*. Plateretti, ni, Murray, and others have recorded their obser- ith respect to this power; and Bonnet particularly most accurate descriptions and figures of his care- ments. The arms or thighs of Tritons amputated



Fore-hand of Sieboldtia.



Skeleton of terrestrial Salamander.
a, Skull seen in profile; *b*, seen from below.

sometimes on one side, sometimes on the other, or both on the same side, were constantly reproduced, and the toes were gradually again formed and endowed with motion. The tail too, cut off at various points, was renewed, pushing out by little and little from the amputated base. In one case the same limb was reproduced four times consecutively in the same animal. Bonnet found that this reproduction was favoured by heat and retarded by cold. He observed that the parts of excised limbs were often reproduced with remarkable alterations, either of defect or excess; the deficiency or exuberance of certain parts taking upon themselves very singular forms. In many species of Tritons the long bones of the limbs detached from their principal articulation, and remaining suspended by some points which still caused them to adhere to the flesh, were found completely consolidated in a few days. The most extraordinary observation was that consequent on the total extirpation of the eye, which was entirely reproduced and perfectly organized at the end of a year. Dufay has recorded their faculty of remaining frozen up in ice for a long period without perishing.

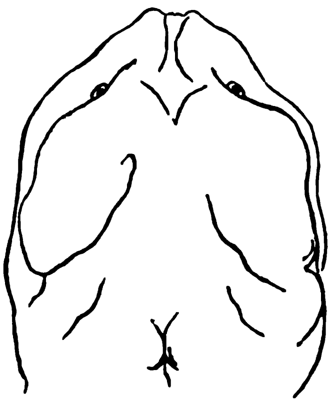
Their tenacity of life was strongly shown in an experiment made by M. Duméril. Three-fourths of the head of a *Triton marmoratus* were removed with a pair of scissors. The mutilated animal was placed by itself at the bottom of a large glass vessel in fresh water about half an inch deep, and which was carefully renewed at least once a-day. The animal, although deprived of the four principal senses, without nostrils, without eyes and ears, and without a tongue, continued to live and move slowly. Its only communication with externals was carried on by touch alone. M. Duméril relates that it was evidently conscious of existence, and walked slowly and cautiously. It raised the stump of its neck towards the surface of the water, and during the first days was seen making efforts to breathe. In less than three months reproduction and cicatrization had so done their work that there remained no aperture for the lungs or for food. At the end of three months, M. Duméril was compelled to leave it to the care of another during an absence, and it died, in all probability, as he observes, from want of attention on the part of the person who undertook the care of it. This specimen is now preserved in the Paris museum, and exhibits, as M. Duméril remarks, the singular fact of an animal having lived without a head; and a proof of the possibility and necessity, even in the Batrachians, of a sort of respiration by means of the skin. In this animal M. Duméril states that respiration was certainly thus carried on for three months, although the stump of the amputated part presented a cicatrice, the smooth surface of which proved, even when examined by a magnifying glass, that there was a complete *obturation* of the œsophagus and larynx.

Dr. von Siebold has also recorded his observations on the reproduction of wounded or lost parts in the *Triton niger*.

We now proceed to illustrate the Salamandridæ by a consideration of the genera *Menopoma*, *Sieboldtia*, *Triton*, *Lissotriton*, and *Salamandra*.

Menopoma.

Generic Character.—Head flat, broad; two concentric rows of teeth (the inner row palatine) in the upper jaw, and a single row only in the lower jaw; tongue free in front; operculum situated about halfway between the posterior edge of the rictus of the mouth and the fore leg; three opercular cartilages, between the posterior two of which is the aperture; feet fimbriated on their outer edge; toes four on the anterior feet, and five on the posterior; of the latter the fourth and fifth are webbed and without claws.



Head of Menopoma, seen from above.

This is the *Abranchus** and *Menopoma* of Harlan; *Protonopsis* of Barton; *Cryptobranchus* of [illegible]ger; *Salamandrops* of Wagler.

Example.—The only species known is [illegible] *ghaniensis*, Harl.; *Salamandrops Allegh*[illegible]

Description.—Length about two feet: [illegible] tened; mouth wide; nostrils projec[illegible] stout; tail compressed vertically, an[illegible] body; legs stout and short; colour sl[illegible] the body; a dark line runs through the e[illegible]

This is the *Tweeg* of the Indians; *Hellb*[illegible] *Ground Puppy*, and young *Alligator* of [illegible] cans; and *Fischsalamander* of the G[illegible]

Locality.—The Ohio and Alleghany rivers.

Habits, &c.—This batrachian is carnivorous and [illegible] voracious; nothing that it can devour is spared by it. [illegible] fishermen dread it very much, and believe it to be [illegible] Indeed the appearance of the animal [illegible] and forbidding.

Michaux appears to have been the first traveller [illegible] discovered and noticed the Menopoma. He states [illegible] torrents of the Alleghanies is found a species of [illegible]der, called by the inhabitants 'Alligator of the [illegible] and that there are some two feet in length. [illegible] the animal which Michaux procured, and whi[illegible] in the Paris museum, very shortly in the article [illegible] (*Nouv. Dict. d'Hist. Nat.*). Barton's [illegible] some length into the subject. There is a [illegible] skeleton of *Menopoma Alleghaniensis* in the [illegible] the Royal College of Surgeons in London.

Menopoma Allegha[illegible]
a, Mouth open, showing the arrangement o[illegible] teeth.

Sieboldtia.

Generic Character.—Head large, trigono-[illegible] produced, vertex convex; forehead concave: [illegible] anterior margin of the maxilla, app[illegible] small, hardly distinguishable; no [illegible] tinct; palatine teeth numerous; [illegible] crest on [illegible] margin of the vomers; posterior feet with [illegible] dages; toes small, free, with depressed [illegible] lobes; tail rather round at the base, very [illegible] the middle and behind, head thickly covered [illegible] body depressed, with transverse folds and a [illegible]neous appendage on each side.

Cuts of the skull, showing the [illegible] of the [illegible] of the fore hand, and of some of the [illegible] above.

This is the genus *Megalobatrachus* of [illegible] Prince of Canino's name, *Siebol*[illegible] priority. The genus belongs to the [illegible] of the Prince's *Salamandridæ*.

Example.—*Sieboldtia maxima.* This, which is [illegible]*lamandra maxima* of Schlegel (*Fauna Japon.*, vii., vii., viii.), was found by Dr. Von Siebold in a la[illegible] basaltic mountain in Japan. He brought away a [illegible] female; but the former devoured the latter duri[illegible]sage, is now alive at Leyden, about a yard [illegible] small fishes. The gill-aperture-slit always [illegible] *Menopoma*, but in this great newt the slits a[illegible] animal is the nearest living analogue of [illegible]*zeri*, the celebrated *Homo diluvii testis* [illegible] which will be noticed in the account of [illegible]*dridæ* at the end of this article.

Triton.

Generic Character.—Head rounded, convex;

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* Afterwards changed to Menopoma by Dr. Harlan, *Abranchus* having been pre-occupied by Van Hasselt to designate a genus of mollusks.

flattened; tongue small, semi-globular, slightly
ıch side, free and pointed behind; palatine teeth
ı, disposed in two rows; body granulous; no paro-
compressed, as long as the body; glandular pores
ıd over the eyes, and a longitudinal row of distant
ɔres along each side. Toes four on the anterior
n the posterior feet. Crests of the back and tail
ale) separate.

le, *Triton cristatus*.

ıtion.—Blackish, orange-coloured beneath, sprin-
ı round black spots; sides dotted with white;
overhanging the lower, but not having a distinct
y warty or tuberculated; tail rather smooth, com-
sharp, trenchant above and below. Length six

n the spring) with an acute toothed dorsal crest;
a longitudinal white stripe. In winter without a
much resembling the female.

.—No crest; lower edge of the tail orange.

—Olive-brown with a sulphureous dorsal line;
orange, spotted with black; lower edge of the tail
d.

the *Lacerta palustris* of Linnæus; *Salamandra*
ıf Ray; *Salamandra cristata* of Schneider, Daudin,
on palustris of Fleming; *Salamandra platycauda*
ıi; *Molge* of Merrett; *Grosse Wassersalamander*
ɔfsalamander of Bechstein; *Warty Lizard* of Pen-
mmon Warty Newt and *Great Water-Newt* of
h.

phical Distribution.—The whole of Europe;
ınd Northern Asia.

—The ponds and ditches of this country abound
the largest British newt, and a most voracious
is. Aquatic insects, and indeed any small living
hich come in its way, are unsparingly devoured.
at destroyer of tadpoles, and the smaller water-
sotriton punctatus, frequently falls a victim to its
ıd voracity. Mr. Bell has taken them more than
ıe act of swallowing an individual of the smaller
hich was so large as to occasion great difficulty
in the act of deglutition. In swimming, the legs
l backwards to lessen resistance, and the animal is
principally by the tail. Every one has observed
, or efts, as they are called in many places, floating
s at the surface of the water, with their limbs ex-
right angles with the body, and their toes spread
ir progression at the bottom of the water and on
erformed creepingly with their small and weak

tion.—This is the species which was the principal
the observations of Rusconi, to which we shall
advert; but before we do so, it is necessary to
ıe reader of the remarks made by Mr. Bell. He
that the male seeks and follows the other sex: the
former is vibrated, and, as it were, smacked by a
imilar to that of smacking a whip, several times
few moments. Rusconi, observes Mr. Bell, asserts,
ıs been followed by most subsequent writers, that
tion is effected without contact; but the latter
that he has reasons, the result of his own repeated
ɔns, for believing this to be a mistake, at least in
cies.

ızani has stated that the eggs, when excluded by
le, fall at once to the bottom of the water; and
hat they come forth from her 'en longs chapelets.'
ıi procured, in the month of May, several of these
ıich he put into a large tub, at the bottom of which
, three days afterwards, about twenty eggs glued
endwise, three to three and four to four, so as to
portions of a string of beads. He gathered up
s carefully, and placed them in a vessel filled with
he water from the tub. After observing them two
aw that they became enlarged and irregular on the
which he regarded as preparatory to the evolution
rm. These appearances increased up to the fifth
ı days, but instead of producing young animals, as
pected, the eggs had lost their transparency, had
overed with a sort of mould, and in short had lost
ty of evolution. The Salamanders left in the tub
e interval deposited more eggs: these he collected
, and thinking that the water which he had pre-
mployed might have been improper for the purpose,
red some from the ditches whence the newts had been taken: still without success. He then turned his attention to artificial impregnation, remembering Spallanzani's success: here too he failed. Accident, as in so many other cases, gave to Rusconi the key of the mode by which the young were brought into life. He had observed, whilst following out his experiments for artificial impregnation, that the Salamanders which had been left in the tub from time to time pressed back their hind limbs beneath the belly, and that in a few moments after this action they laid one or two eggs; these eggs did not always fall to the bottom of the water, but sometimes remained attached for a moment to the vent itself, so that some of the animals might be seen running to and fro in the tub with two or three eggs thus attached. He was at a loss to account for this pressing action of the hinder limbs, and was thinking of making some arrangement in order to enable his salamanders to support themselves at their ease during the night at the surface of the water for respiration, with a view to continuing his observations on them, when a fresh parcel of these animals were brought to him in a pail, in which many plants of *Polygonum Persicaria* had been placed to prevent the overflow of the water from the pail. He made a small bunch of these plants, and put the stems of them under a large stone to confine them at the bottom. In the evening he inspected the tub, and found all his salamanders so comfortably accommodated by the help of the plants, that by keeping the head a little elevated their nostrils were kept above the surface of the water, so that their respiration was easy. A few days afterwards, when Rusconi was examining his salamanders with the view of selecting a male and a female for repeating his experiments of artificial impregnation, he remarked that there was not one egg at the bottom of the tub. Whilst under the influence of surprise at this, he observed one of his salamanders approach one of the leaves of the plant, and direct its snout to it as if to smell it. The animal then moved gently on the leaf in the direction of its breadth, and resting upon it, pushed back its hind limbs, so as to fold back and enclose the leaf between its feet. It stayed about a minute in this position and then went away, leaving the leaf so that its apex was turned back on the petiole. After a lapse of three minutes Rusconi saw the salamander approach another leaf, apparently disposed to place itself thereon, when, casting his eyes accidentally on the branches of *Persicaria*, he discovered many other leaves doubled back just as he had seen the salamander double back that above noticed. He immediately took the bunch of plants from the tub, and on examining the doubled leaves he found that each of them enclosed an egg. He further observed that these leaves were unable to reassume their natural position, because their two surfaces were held together by the gluten with which the egg is covered; and he had to overcome the adhesive resistance before he could expand the leaf.

Rusconi enters into minute detail of the actions of the male from the time of its first pursuit of the female to the discharge of the prolific fluid, for which we refer the reader to the work itself.* During the time that the male is lashing the female with his tail, she remains immoveable; at last she moves, and slowly goes in search of a plant proper for receiving her eggs, choosing almost always the *Persicaria*. She first approaches her head to the edges of a leaf, and turns it with her snout in such a way that the lower surface of the leaf, which was towards the bottom, is turned towards her breast: then with her fore paws she passes the turned leaf beneath her belly, seizes it with her hind paws, and conducts it beneath the vent, folding it at the same time, and forming with it an angle the opening of which is directed towards the tail. The egg in escaping from the vent would thus pass through the middle of the angle formed by the leaf, but the salamander stops it in its fall by her hind feet, shuts up this angle with them, and thus forms in the leaf a fold in which the egg is held. Still on the removal of the feet the egg would fall to the bottom of the water; but the careful parent, before she quits the leaf, folds it so firmly with her hind feet that the gluten with which the envelope of the egg is surrounded spreads from the pressure on the two internal surfaces of the leaf, and prevents the folds from opening. When several eggs have been laid in this manner, in different leaves, the female remains quiet until another male comes to caress her. Rusconi did not ascertain how long the period of laying continued; but he found eggs as early as the middle of April and as late as the middle of July.

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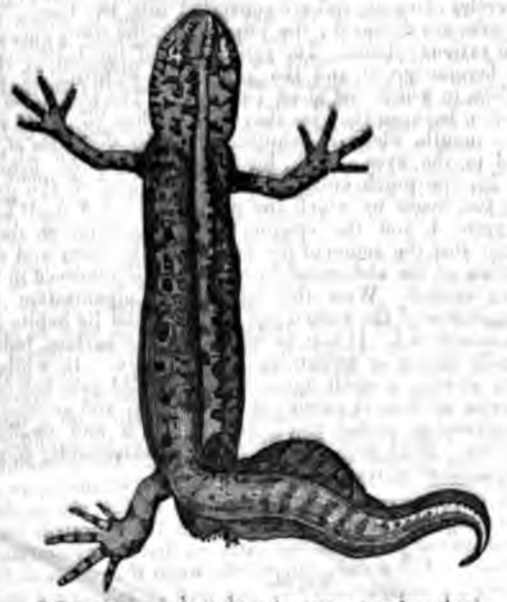
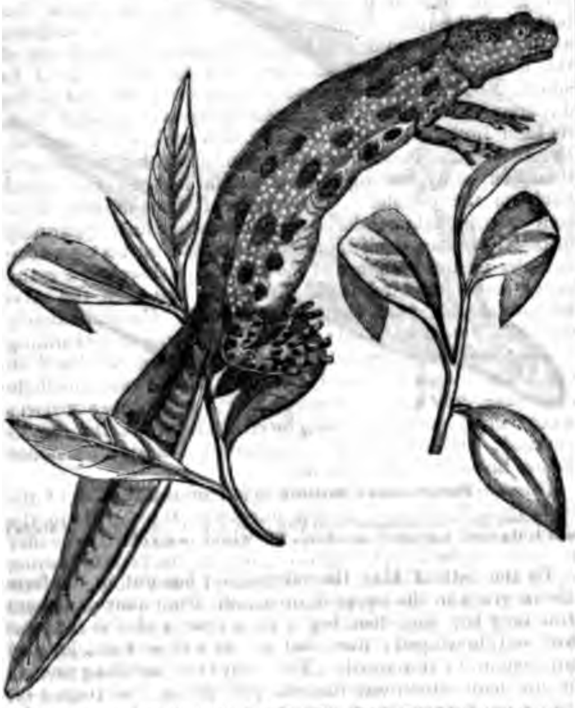
* 'Amours des Salamandres Aquatiques, et Developement du Tetard de ces Salamandres depuis l'œuf jusqu' à l'animal parfait,' Milan, 1821.

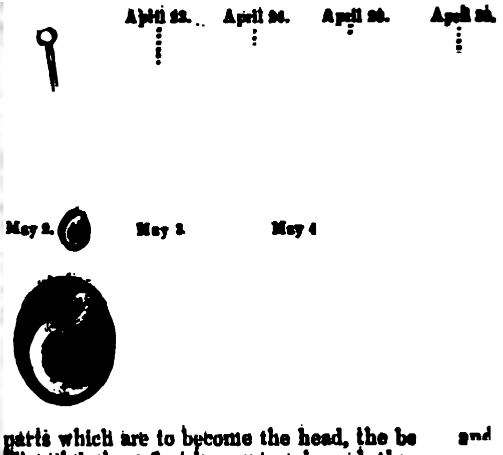


Triton cristatus, male, in the spring season, seen from above.



Triton cristatus, female, in the act of compressing a turned leaf upon her included egg. The leaves folded back represent those in which eggs have already been thus laid. (Rusconi.)

The following figures, given by the same author, exhibit the several stages of the evolution of the egg which was kept on its proper leaf: these stages are denoted by the dates of the days on which the drawings were made. Thus the figure marked 23rd April shows the egg of its natural size, and the figure below it the same magnified.



April 23.
April 24.
April 26.
April 28.
May 2.
May 3.
May 4.

The temperature of the water during the period of Rusconi's observations varied from 22° to 27° of the centigrade scale. The globule in the centre of the ovum is white with a yellow tint, and is environed with a glairy matter, to which it is not attached, so that it can move freely in every direction. Its envelope is membranous, of glassy transparence, and covered with a very clear viscid matter: the specific gravity of this matter appears to be less than that of the globule. In three days the globule had undergone the change exhibited at April 26. Under the microscope may be observed in the embryo the commencement of the parts which are to become the head, the be and The globule at first becomes enlarged, then e its previously smooth surface presents some nences. If it has not been fecundated, or has lific power, it enlarges, nevertheless, during the as in ordinary cases, but afterwards changes so ble a vesicle half filled with water: when this ap came on, the egg had lost its vitality.

On the 28th April (fifth day) the embryo has grow that it becomes bent in order to accommodate i circumscribed envelope. Now the head, abd are easily distinguishable, and near the head ex- tremity) small elevations (the rudiments of gi feet) are perceptible. These parts become more by the 30th, when in the concave side of the towards the head a small furrow is seen wl the head from the abdomen, and the rudime are distinctly visible along its convex border.

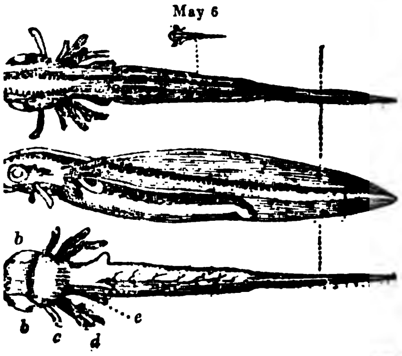
By the 2nd of May the position of the embryo is changed and the tail has already assumed its oar-like form. There is not as yet any appearance of mouth or eyes; but towards the extremity of the head small blackish points may be observed, and a slight degree of contraction between the rudiments of the gills and those of the fore-feet, distinguishing the head from the chest. Now the embryo begins to move, and its heart may be seen to beat: colour too begins to be present. This appears to be a critical state of the embryo; for almost half of those whose development was watched by Rusconi died at this period or soon after.

3rd May. The embryo, which has changed its position three or four times during the last twenty-four hours, shows in that which it here presents all the upper part of the body, which is sprinkled with little blackish spots disposed into two longitudinal bands, which extend from the head to the tail. On the side of the head, and before the two elevations which are the rudiments of the fore-feet, filaments in the number of four on each side may be observed. The two first are not gills, as some authors suppose, but are organs of station, which the author designates as claspers or hooks (crochets) on account of their analogy to the two hooks by which the embryos of the green frog suspend themselves to the leaves of the lentil.

4th May. The changes of position become more frequent. In that here presented the embryo shows the lower part of its head and trunk, which is white inclining to green. On the chest between the gills of the two sides, where the pulsations of the heart are seen, small irregular blackish spots are observable. Before the two claspers are seen also other blackish spots, forming the junction of the two bands which run along the back, as shown in the preceding figure. The circulation of the blood, which is simple, and performed by a single curved vessel, is seen in the gills, which are of a glassy transparence, and consist only of a single filament without leaflets as yet. The blood is white. The claspers or hooks in front of the gills are lengthened, and larger towards their ends than at their origin. The sides of the embryo are dotted with deep green in two irregular bands, extending from the fore-feet to the extremity of the abdomen.

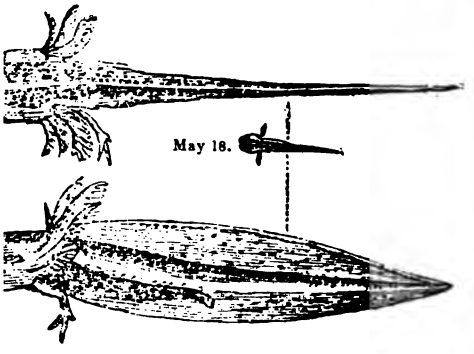
5th May. Traces of the eyes may now be just seen; and the rudiments of two leaflets are perceptible on the two longest gills. The embryo now changes its position rapidly, and appears constrained by the confinement of its prison. It tries to extend itself in a straight line, and continually strong pressure to the walls of its envelope. The ne which forms the upper border of the tail has now l itself, diminishing in its progress, to the shoul-

ay. The upper small figure shows the young sala- seen from above, and of the natural size, just es- om the envelope. Before its escape, the embryo as es gradually dilates the envelope, which at last it d so forces its way out. If it be slightly touched, it ateral movements with its trunk and tail, and thus fter a fashion, but in a different manner from that afterwards adopts. It moves like an automaton, now against a leaf, now against the side of the nd as soon as it does so, it suspends itself to the ack by its two hooks, whose extremities are covered aseous matter. The young salamander possibly ntinually at this period of its existence; for if the slightly shaken, its body oscillates with the mo- he water, as though it were inanimate. Several now passed without motion. Afterwards it makes eral movements with its tail, without any apparent cause, and swims in its own manner; then again itself to some other leaf, and continues to sleep, nplete repose for half a day or more. If at this meets with nothing to which it could attach itself, the bottom of the water, where it continues re- ometimes on its side and sometimes on its belly. ne eyes are scarcely defined, though they form two nces on the sides of the head, and its mouth is so raced that attentive observation is required to de- or it is indicated only by a slight transverse depres- eath the head, and between the two prominences y the eyes, and in the middle of the space between ior border of the head and the origin of the neck. feet begin to separate like buds from the gills. it are gradually furnished with small leaflets. In the author is of opinion that the life of the sala- purely organic.



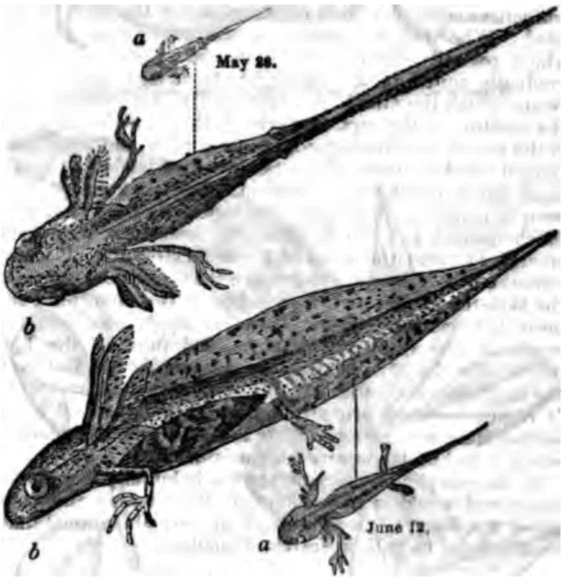
f development of Triton cristatus after exclusion from the egg.

s the salamander in this stage, magnified and seen w. *bb* are the two prominences formed by the the eyes, and between them is the slight depres- h afterwards becomes the mouth. *c*, the hook of side; *d*, the gills of the same side; *e*, rudiment of of the same side; *f* represents the same seen in nd *g* the same seen from above.



Further stages of development of Triton cristatus.

Rusconi has shown, in the middle and small figure, al size of the Salamander-tadpole on the eighteenth of May, twelve days after its exclusion from the egg. By this time the fore-feet have become lengthened, and are divided at their extremity like a bicuspid tooth: these two tubercles elongate, and are converted into two toes. Now the eyes are disclosed; the pupil black, the white speckled with various colours. The yellow back of the little animal has become green, and the gills are now furnished with leaflets, in which red blood circulates. The transverse depression between the eyes above noticed has become a very large mouth, whose extremities extend on the sides of the head to the eyes. The head, hitherto narrow behind, has become much enlarged near the origin of the gills. The two hooks by which the animal anchored itself have disappeared, and the opaque body has become so transparent that the action of the heart and the form and disposition of the abdominal viscera may be observed in the living animal. With this advance in organization the sluggishness of the animal has vanished, and its habits are now manifested. It may be seen near the surface, hiding beneath leaves or swimming with rapidity. If, while it floats at rest, a small aquatic insect should pass before it near the surface, it pursues it deliberately, and as soon as it approaches within reach, darts upon it and swallows the prey. Here then we have the little salamander in the enjoyment of active animal life.



Further stages of development of Triton cristatus.

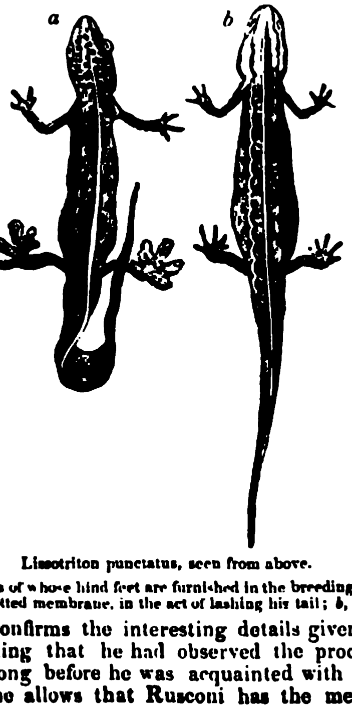
a, shows the young salamander at this stage, natural size, seen from above; and *b*, the same magnified, seen from above and in profile.

By the 28th of May the salamander has put on the form above given in the upper figures, seen from above. About this time the hind-feet begin to appear, and the fore-feet are well developed; these last are, as will be seen, long in proportion to the trunk. The following are the principal points manifested under the microscope in this stage:—1, two small eminences or excrescences, extending from the axillæ to the abdomen; 2, the parietes of the abdomen take the colour of the insects on which the animal feeds; 3, the changes of colour from yellow to green, during the growth of the tadpole, are purely accidental, and commence immediately on the escape of the animal from the egg; 4, the inner toes first push forth, and this holds good also with regard to the hind feet; 5, the amylaceous bone of the organ of hearing is now formed, and may be seen through the skull and skin; 6, at this period, and even sooner, the animal begins to expel air from the mouth. The two lower cuts show the same salamander on the 12th June; the small figure represents it of the natural size and as seen from above, and the larger figure magnified and in profile. Now the hind feet have almost attained their development, though the fifth toe is wanting. The lungs extend about half-way down the trunk, and are visible through the parietes of the abdomen. The longest gills, which were furnished with only thirteen or fourteen leaflets thirteen or fourteen days previously, have now nearly twenty.

Last stage of the tadpole of Triton cristatus.

On the 18th of July the young salamander, as represented above, had arrived at the maturity of its tadpole state, and it is represented watching a small mollusk to ascertain whether it is living and fit for prey. Rusconi found that on this day the gills appeared rather shorter than on the day before. On the next day the leaflets at the extremities of the gills were obliterated, and the gill-stem itself was shortened. This shortening and obliteration went on daily, till, at the end of five days, they were reduced to mere bud-like eminences covered with a continuation of the skin of the head. While this was going on, the duplicature of skin, which partially covered the branchial apertures, became gradually united to the chest; the trenchant membranous crests, which the arches bore externally, were obliterated; the aperture at the ears, through which the water taken in at the mouth was discharged, was daily more and more contracted; and the crest of the tail, which extended up to the head, was contracted also. Within, other great changes had been in progress. Both jaws, but especially the lower, were much ossified, and the teeth of the lower jaw were hard enough to resist the point of a needle strongly. Rusconi remarks that if he were to arrange the component parts of the skeleton at this period, according to their hardness, the lower jaw would stand first, then the upper one, then the bones of the skull, the vertebræ, and those of the four limbs. On the 27th of July the salamander had lost even the smallest trace either of gills or of branchial apertures. It respired atmospheric air only, and having arrived at its perfect state, made strong efforts to escape from the vessel in which it had undergone its metamorphosis.

In its complete state this species habitually lives in the water, and is seldom to be found on land unless the pond which has been its abode is dried up, and the animal finds itself obliged to walk in search of another.



Lissotriton punctatus, seen from above.

a, Male, the toes of whose hind feet are furnished in the breeding season with a black-spotted membrane, in the act of lashing his tail; *b*, female.

Mr. Bell confirms the interesting details given by Rusconi, remarking that he had observed the process many times, and long before he was acquainted with Rusconi's book; but he allows that Rusconi has the merit of first publishing an accurate account of the species.

The development of the common smooth newt, *Lissotriton punctatus*, Bell; *Triton punctatus*, Auct.; *Triton palustris*, Laur.; *Salamandra punctata*, Daud.; *Molge punctata*, Merr.; *Salmandra exigua*, Rusc.; and *Brown Lizard* of Pennant, was also observed by Rusconi; but it did not require particular notice, being very similar to that of *Triton cristatus*. *Triton punctatus* however showed itself much the more brisk animal of the two; and the lashings of the tail of the male in his approaches to the female were much more rapid.

Salamandra.

Generic Character.—Head thick; eyes large; gape of the mouth ample; tongue broad; palatine teeth arranged in two long series; parotids large; body sprinkled with many small glands; toes free; tail rather smooth.

Example, *Salamandra maculosa*, Laur.

Description.—Black with yellow spots; numerous prominent warty excrescences on the sides; tongue very large; palatine teeth spatuliform; toes smooth.

This is the *Salamandra* of Gesner; *Salamandra terrestris* of Aldrovandus, Ray, and others; *Salamandre de terre* of the French; and *Gefleckte Erd-Salamander* of the Germans.

Locality.—Central Europe and the mountainous parts of the south of Europe.

Generation, Habits, &c.—This land Salamander is, unlike the Tritons, ovoviviparous, though the young, at first, inhabit the water and undergo metamorphosis till they arrive at the mature state which fits them for living upon land, where they haunt cool and moist places, being not unfrequently found about fallen timber or old walls. The food principally consists of insects, worms, and small molluscous animals. In the winter it retires to some hollow tree or hole in an old wall, or even in the ground, where it coils itself up and remains in a torpid state till the spring again calls it forth. As it increases in size, it constantly sheds its skin, which is moulted in flakes; at least such was the process in *Salamandra subviolacea*, observed by Dr. Barton.

We have seen that the body of the Salamander is largely covered with warty glands. These secrete a milky fluid of a glutinous and acrid nature like that of the toad [Frogs, vol. x., p. 493], which, if not capable of affecting the larger and more highly organized animals, appears to be a destructive agent to some of those which are less highly organized. Thus Laurenti provoked two grey lizards to bite a salamander, which at first attempted to escape from them, but being still persecuted, ejected some of this fluid into their mouths; one of the lizards died instantly, and the other fell into convulsions for two minutes and then expired. Some of this juice was introduced into the mouth of another lizard; it became convulsed, was paralytic on the whole of one side, and soon died. According to Dr. Barton this fluid,—which the animal secretes in large quantities when irritated, and is then capable of ejecting it to some distance,—is not soluble in water, though it dissolves readily in spirit of wine. He found the taste of the juice of *Salamandra subviolacea* extremely acrid, resembling corrosive sublimate, and very astringent.

Such is the extent of the foundation for the long cherished assertion that the Salamandra was one of the most venomous of animals. Nicander, in his *Alexipharmaca*, gives an appalling picture of the symptoms produced by its bite. The Romans looked on it with horror, as most destructive, and considered it as deadly a part of the poisoner's laboratory as aconite or hemlock. Hence came a proverb that he who was bitten by a Salamander had need of as many physicians as the animal had spots; and another still more hopeless,—'If a Salamander bites you, put on your shroud.'

Not only was its bite considered fatal and the admi of the animal itself taken internally believed to be de anything that its saliva had touched was said to becom sonous. Thus, if it crept over an apple-tree, it was s to poison all the fruit with its saliva; and even which the fluid fell were believed to affect those wh them with vomiting. These fables had taken such hold, that it was thought worthy of record in the *Nat. Cur.* that a man had eaten a salamander, wh wife had put into his food in the hope of becoming a w without suffering any inconvenience. Maupertuis ap the teeth of a salamander to the thigh of a fowl from wh had plucked the feathers, to the lips and tongue of a og, and to the tongue of a Guinea fowl; in neither case were ny symptoms of poison manifested. Another prejudice gainst this reptile was that it sucked cows and dried up r udders.

t the grand absurdity of all was the belief that the ander was incombustible; that it not only resisted the n of fire, but extinguished it, and, when it saw the e, charged it as an enemy which it well knew how to quish.

Aristotle, whose Salamandra (σαλαμάνδρα) this appears to e, has been quoted as giving his sanction to this belief, and ideed he cites it as a proof that there are animals over hich flame has no power; 'the Salamandra, as they say, hen it goes through fire, extinguishes it.' (*Hist. An.*, . 19.) Now this is evidently only a reference to report; nd it is not improbable that a copious secretion of the fluid bove noticed might, in a rapid and short passage, so damp e fire, that the animal might get through comparatively nhurt. Ælian (ii. 31) says not only that it will live in the es, but that it attacks fire like an enemy. Nicander, corides, and Pliny all add their authority; and the not only relates that they extinguish fire by their , but that they are without sex and produce nothing. e dwells on their poison as being of the worst description, d is profuse in his catalogue of remedies. (*Hist. Nat.*, xix. 4.) But even so late as 1789 there was an attempt revive these wondrous tales. A French consul at Rhodes tes that while sitting in his chamber there, he heard a cry in his kitchen, whither he ran and found his cook horrible fright, who informed him that he had seen Devil in the fire. M. Pothonier then states that he ed into a bright fire and there saw a little animal with open uth and palpitating throat. He took the tongs and enavoured to secure it. At his first attempt, the animal, hich he says had been motionless up to that time (two or ree minutes), ran into a corner of the chimney, having the tip of its tail in escaping, and buried itself in a of hot ashes. In his second attempt the consul was sucul, drew the animal out, which he describes as a kind small lizard, plunged it into spirit of wine, and gave it Buffon. This appears to be very circumstantial, and M. othonier, whose head was evidently filled with preconed opinions, may be acquitted of any intention to deceive. he animal was in the fire there can be no doubt, and very likely that it was brought in with the fuel; that secretion might have enabled it to resist the action of fire for a few moments, so as to prevent its being irely consumed, is not improbable, but that it remained hurt for two or three minutes in the midst of a bright incredible. Ordinary people are never more loose measuring time, especially when excited. Still ery probable, such is the appetite for the marvellous, M. Pothonier's story, which was published, might perpetuated error a good while longer, had it not ed the *coup de grace* from Sonnini, who happened me to Rhodes shortly after this extraordinary . Of M. Pothonier he speaks as being a very man, but completely ignorant in all that related tural history. The consul was very communicative to about the prodigy, and showed him the lizard. Son- immediately saw what the excited M. Pothonier did e, namely, that the feet and some parts of the body so-called incombustible animal were half roasted.

go back: Galen knew that it would burn, and Mat- r it burn.

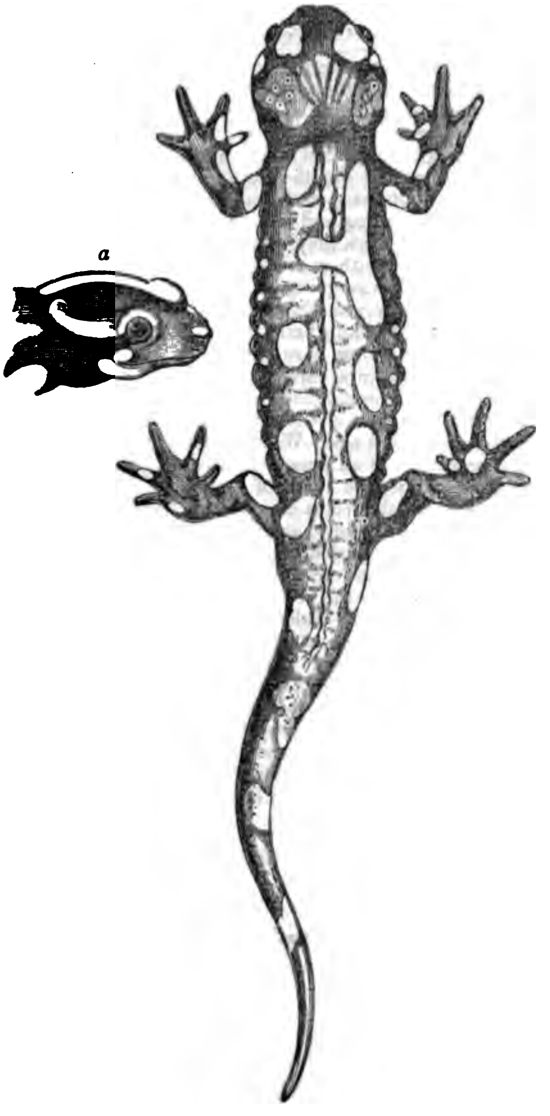
skin of an animal which could resist the action should be considered proof against that element is to be wondered at. We accordingly find that a cloth said made of the skins of salamanders was incombustible, as oticed by Marco Polo, who however was shrewd enough rve that these fire-proof cloths were really made of a l substance (asbestos, no doubt, which the old ers termed *salamander's wool*). Such most probably the salamander-cloth sent by the Tartar king to the n pontiff, in which the holy napkin (*sudarium Do-* , is preserved.

ng the other fables may be noticed the belief that va of the salamander was depilatory. Thus Martial ii., Ep. lxvi.):—

> 'Desine jam Lalage tristes ornare capillos,
> Tangat et insanum nulla puella caput.
> Hoc salamandra notet, vel sæva novacula nudet,
> Ut digna speculo fiat imago tua.'

Its heart, worn as an amulet, was considered to be a prophylactic against fire, and it was used in medicine to eradicate leprosy.

It could hardly be expected that the alchymists would neglect animals of which such wonders were rife; and we accordingly find that the power of transmuting quicksilver into gold was attributed to them. To this end the wretched reptiles were placed in a vessel on the coals, and quicksilver introduced through an iron tube was poured upon them. This experiment was supposed to be accompanied with danger to the life of the operator. Those who would further dwell on the legends connected with this subject may consult Funk's work, *De Salamandræ Terrestris Vita, Evolutione, et Formatione.*



Salamandra maculosa, seen from above. *a*, profile of head.

FOSSIL SALAMANDRIDÆ.

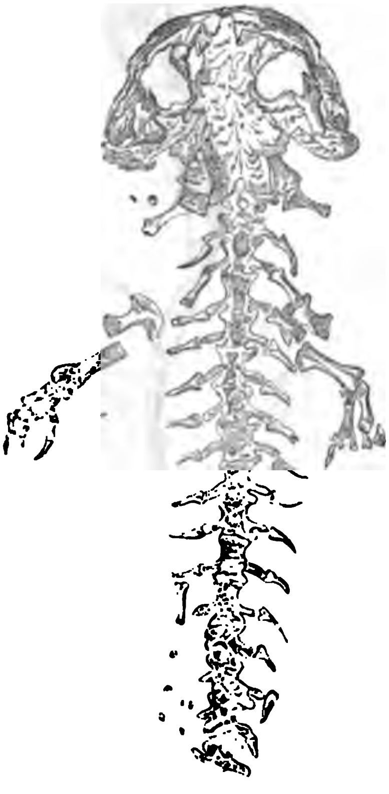
Andrias.

Few fossils have awakened more curiosity than the *Homo diluvii testis* of Scheuchzer, who was unwearied in collecting organic remains, which he considered irrefragable evidence of the general deluge. At length he obtained from the Œningen beds (Miocene period of Lyell) a fossil which he viewed with transport as the unequivocal remains of man himself. A short description of this specimen was published by him in the 'Philosophical Transactions' for 1726. He again brought forward this piece of *good fortune*—in his rapture he writes the two last words in Greek—in his 'Physica Sacra,' where he tells us that previously he had only possessed two dorsal vertebræ. Of the humanity of his prize he certainly entertained no doubt:—'quia,' says he, speaking of the fossil, 'indubium, quia non unam exhibet partem, sed bene multas, imo pene dimidium sceleton. Quia non duntaxat impressa figura, ex qua vaga et superba imaginatio fingere possit quidlibet ex quolibet, sed ipsa lapidi immersa substantia ossium, imo carnium, et partium carnibus molliorum, præcisa in magnitudine proportio: verbo λείψανον maledictæ illius et aquis sepultæ gentis, unum ex rarissimis.' He gives no bad figure of the fossil in tab. xlix. of the work last quoted. When we look at that figure, it is difficult to conceive how such remains could have appeared to a physician, who must have had some acquaintance with osteology, to be those of man; and we can only account for it by the blindness which an excited imagination and a determined adherence to theory can produce. The iteration and determination of Scheuchzer had its effect, and naturalists adopted his opinions. Gesner (1758) appears to have been the first who threw deserved doubt on the alleged nature of the fossil; for though he quotes it as an anthropolite, he nevertheless, having become possessed of a similar specimen, offers his conjecture that it was a fossil fish (*Silurus Glanis*, Linn.), and the obsequious naturalists were now as ready to follow him as they had been eager to run after Scheuchzer.

Gesner's specimen does not appear to have been engraved, nor another which was said to be in the convent of Augustins at Œningen; but a third specimen, more complete than Scheuchzer's, came into the possession of Dr. Ammann of Zürich, and is now in the British Museum. A figure of this was published by Karg, in the 'Memoirs of the Society of Naturalists of Suabia.'

Cuvier well observes that a comparison of the specimen with the skeleton of man must at once have destroyed the idea that it was an anthropolite; and it would be a waste of space to repeat here the details of that comparison which Cuvier so well follows out, and to which we refer. (*Ossemens Fossiles*, tom. v., pt. 2, p. 433, ed. 1824.)

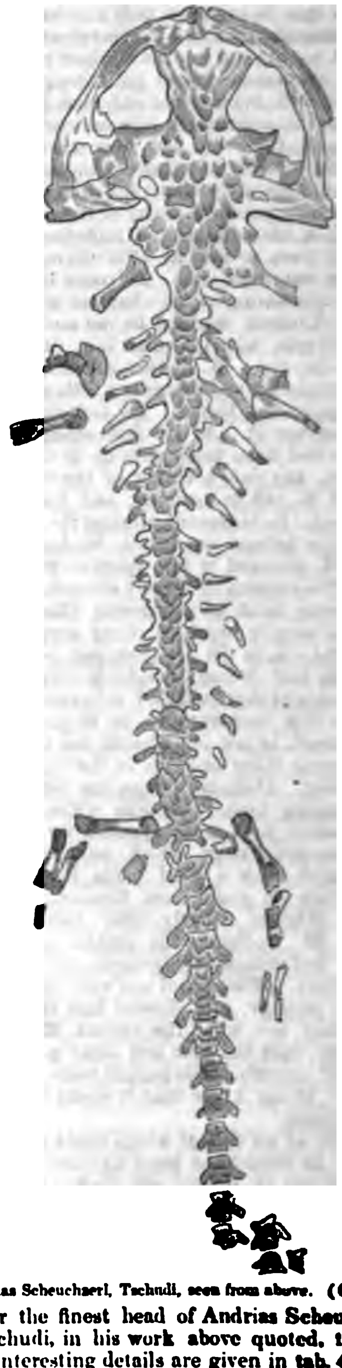
Karg, after figuring Dr. Ammann's specimen, expressly stated that he had no doubt that the fossil was a *Silurus*, an opinion which Jæger refuted by placing by the side of the figure of the fossil, one of the skeleton of *Silurus glanis*. Cuvier disposes of this opinion with the same success as attends his former demonstration.



Anterior part of Andrias Scheuchzeri, Tschudi, seen from above. (Cuv.)

The rounded head and great orbits of the fossil struck Cuvier as strongly resembling the head of a frog or a salamander; and he states that, as soon as he beheld Karg's figure, he perceived in the vestiges of the hind feet and the tail evidence in favour of the last-named genus. H that he learnt with great pleasure, from the note an by Jæger to Karg's memoir, that M. Kielmeyer tained the same idea; and he observes that in a Pierre Camper to Burtin, the former remarks that a pe lizard has been able to pass for an anthropolite.

Cuvier, being at Haarlem in 1811, obtained permi work upon the stone which contained the pretended polite of Scheuchzer, for the purpose of unco bones which might be still hidden there. During ration, the figure of the skeleton of a salamander was before the operators; and Cuvier relates the ple which they felt, as they saw, while the chisel chipped pieces of the stone, the bones which the figure had alr announced.



Andrias Scheuchzeri, Tschudi, seen from above. (Cuv.)

But by far the finest head of Andrias Scheuchzeri gured by Tschudi, in his work above quoted, tab. 3; many most interesting details are given in tab. 4 and These show how nearly allied this gigantic fossil newt to *Sieboldtia maxima*.

Salamandra ogygia, Goldf., is found in the Braunk (Tertiary), where also *Triton Noachicus*, Goldf., o *Triton palustris? fossilis* of Karg is from the slate.

Human fossil bones have been discovered in the
ı bone-caverns, with bears, rodents, &c., and are
by Dr. Schmerling, in his interesting work on the
'ound in a cavern near Liège.

Buckland (*Bridgewater Treatise*) remarks that fre-
liscoveries have been made of human bones and rude
of art, in natural caverns, sometimes enclosed in
te, at other times in beds of earthy materials, which
erspersed with bones of extinct species of quadrupeds.
:ases, he thinks, may be explained by the common
of mankind in all ages to bury their dead in such
ient repositories. 'The accidental circumstance,'
ıes Dr. Buckland, 'that many caverns contained the
f extinct species of other animals, dispersed through
ne soil in which human bodies may, at any subse-
eriod, have been buried, affords no proof of the time
hese remains of men were introduced. Many of the
have been inhabited by savage tribes, who, for con-
:e of occupation, have repeatedly disturbed portions
in which their predecessors may have been buried.
isturbances will explain the occasional admixture of
nts of human skeletons and the bones of modern
peds, with those of extinct species introduced at
ırly periods and by natural causes. Several accounts
een published within the last few years of human
discovered in the caverns of France and in the pro-
' Liège, which are described as being of the same
ty with the bones of hyænas and other extinct qua-
that accompany them. Most of these may probably
f explanation by reference to the causes just enu-
l. In the case of caverns which form the channels
erranean rivers, or which are subject to occasional
:ions, another cause of the admixture of human
vith the remains of animals of more antient date
found in the movements occasioned by running

ame learned author observes that the most remark-
d only recorded case of human skeletons imbedded
id limestone rock is that on the shore of Guada-
ıdding that there is however no reason to consider
ones to be of high antiquity, as the rock in which
:ur is of very recent formation, and is composed of
ıated fragments of shells and corals which inhabit
acent water. Such kind of stone is frequently
in a few years from sand-banks composed of similar
ls, on the shores of tropical seas. (*Bridgewater*
e, vol. i) One of these skeletons, described by Mr.
Phil. Trans., 1814), is in the British Museum. See
as to the rock in which the skeletons are imbedded,
'rans., 1818, vol. xii.

ınd, a good observer, has lately published his dis-
f human remains with those of *Megatherium*, &c.;
is of opinion that the former are of the same epoch
of the latter. The cranium has the peculiar shape
istinguishes the antient Peruvian.

AMANDROÏ'DES. Under this generic title Pro-
äger described a fossil reptile from the German
, giving it the specific name of *giganteus*. This
w appears to be identical with MASTODONSAURUS and
AURUS. Professor Owen therefore proposes to de-
this gigantic genus of extinct Batrachians—for to
er he has satisfactorily shown that the form belongs
e name of *Labyrinthodon* (from the extraordinary
e of its teeth, to which we shall presently advert),
paper 'On the Teeth of species of the genus *Laby-*
on (*Mastodonsaurus*, *Salamandroïdes*, and *Phyto-*
(?) of Jäger) from the German Keuper and the
ıe of Warwick and Leamington.' Of this paper the
g abstract is given in the *Proceedings of the Geo-*
Society of London for 1841:—

Warwick sandstone having been considered by
:ologists to be the equivalent of the Keuper,* and
rs of the Bunter Sandstein,† and as its true position
to be determined, Mr. Owen, in the preliminary
to his memoir, pointed out the assistance which
overy of reptilian remains in the Warwick sandstone,
ame generic characters as those of fossils obtained
Keuper of Germany, may afford in determining the
ı.

re he proceeded to describe the fossils forming the
e object of his paper, Mr. Owen showed that the genus *Phytosaurus* was established on the casts of the sockets of the teeth of *Mastodonsaurus;* and that the latter generic appellation ought not to be retained, because it recalls unavoidably the idea of the mammalian genus *Mastodon*, or else a mammilloid form of the tooth, whereas all the teeth of the genus so designated are originally, and, for the greater number, permanently of a cuspidate and not of a mammilloid form; and because the second element of the word, *saurus*, indicates a false affinity, the remains belonging not to the Saurian, but to the Batrachian order of reptiles. For these reasons, and believing that he had discovered the true and peculiarly distinctive dental characters of the fossil, he proposed to designate the genus by the term *Labyrinthodon.*

'The only portions of the Batrachian found in the Keuper of Germany which have hitherto been described, consist of teeth, a fragment of the skull, and a few broken vertebræ, and in the Warwick sandstone of teeth only. In this memoir therefore Mr. Owen confined his attention to a comparison of the dental structure of the Continental and English remains. The teeth of the *Labyrinthodon Jaegeri* (*Mastodonsaurus Jaegeri*, Meyer) of the Keuper are of a simple conical form, with numerous fine longitudinal striations; and the teeth transmitted to Mr. Owen from the Warwick sandstone by Dr. Lloyd bear a very close resemblance to them. Their external characters not being sufficient to establish either specific or generic identity, Mr. Owen had sections prepared for microscopic examinations of portions of teeth of the *Labyrinthodon Jaegeri* forwarded to him by Prof. Jäger, and of the English reptile; and though from his previous examination of the intimate texture of the teeth of the Plesiosaur, Megalosaur, as well as of the crocodile, Monitor, and most recent Lacertians, he did not hope to detect such modifications of structure as would obviously mark specific or even generic identity, yet the slices exhibited such decided characters, and those of the German fossils agreed so intimately with the sections obtained from the Warwick specimen, that Mr. Owen was enabled not merely to separate these fossils from all known reptilian animals, but to establish a generic community of character in the Keuper and sandstone remains. It was not however until he had caused sections to be made in various directions, and had studied them attentively in comparison with the teeth of true Saurians, Batrachians, and other animals, that he was enabled to comprehend the principle of the singular cerebriform convolutions which pervade the dental structure of this remarkable reptile. The base of the tooth of the *Ichthyosaurus* approaches most nearly in character to the peculiarities of nearly the entire tooth of the *Labyrinthodon.* It is impossible to convey clearly without illustrations the structure alluded to. It may however be stated that in the fang of the tooth of the *Ichthyosaurus* vertical folds of the external layer of cement (the enamel ceasing at the base of the crown) are inflected inwards at pretty regular distances around the circumference of the tooth, towards the centre, to a distance about equal the breadth of the interspaces of the inflected folds; the interspaces being occupied by corresponding processes of the dentine, which radiate from the central mass of that substance. The thickness of this interblended cement and dentine surrounding the pulp-cavity is about one-eighth of the diameter of the tooth.

'The plan and principle of the structure of the tooth of the *Labyrinthodon* are the same as those of the tooth of the *Ichthyosaurus*, but they are carried out to the highest degree of complication. The converging vertical folds of the external cement are continued close to the centre of the tooth, and instead of being straight simple lamellæ, they present a series of irregular folds, increasing in complexity as they proceed inwards, and resembling the labyrinthic anfractuosities of the surface of the brain; each converging fold is slightly dilated at its termination close to the pulp-cavity. The ordinary laws of dental structure are however strictly adhered to, and every space intercepted by a convolution of the folds of the cement is occupied by corresponding processes of the dentine. These characters were presented by a transverse section of a fragment of a tooth of the *Labyrinthodon Jaegeri* from the German Keuper, which included about the middle third part of a tooth, and Mr. Owen considers that the entire length of the tooth might be 3½ inches, and the breadth at the basis 1¼ inches.

'The external longitudinal grooves, which correspond to the inflected folds of the cement, extend upwards from the base of the tooth to about three-fourths of its height, decreasing in number as the tooth diminishes in thickness, and disappearing about half an inch from the summit of the tooth. Each fold of cement penetrates less deeply as the groove approaches its termination; and Mr. Owen conceives that the structure of the upper part of the tooth may be more simple than that of the lower, but he has not yet been able to extend his investigations to it.

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* See 'Proceedings,' vol. ii., p. 453
† Ibid., vol. ii., p. 565.

'The dentine consists of a slender, central, conical column, or "modiolus," hollow for a certain distance from its base, and radiating outwards from its circumference a series of vertical plates, which divide into two, once or twice, before they terminate at the periphery of the tooth. Each of these diverging and dichotomizing vertical plates gives off throughout its course narrower vertical plates, which stand at nearly right angles to the main plate, in relation to which they are generally opposite, but sometimes alternate. Many of the secondary plates which are given off near the centre of the tooth also divide into two before they terminate. They partake of all the undulations which characterise the inflected folds of the cement.

'The central pulp-cavity is reduced to a line, about the upper third of the tooth; but fissures radiate from it, corresponding in number with the radiating plates of the dentine. One of these fissures is continued along the middle of each plate, dividing where it divides, and penetrating each bifurcation and process; the main fissures extend to within a line or half a line of the periphery of the tooth; the terminations of these, as well as the fissures of the lateral processes, suddenly dilating into subcircular, oval, or pyriform spaces. All these spaces constitute centres of radiation of the fine calcigerous tubes, which, with their uniting clear substance, constitute the dentine. The number of these calcigerous tubes, which are the centres of minor ramifications, defies all calculation. Their diameter is the $\frac{1}{7000}$th of a line, with interspaces equal to seven diameters of their cavities.

'Mr. Owen then compares the structure of the section of the tooth procured in the sandstone of Coton-End Quarry, and lent to him by Dr. Lloyd of Leamington. The tooth nearly resembles in size and form the smaller teeth of *Labyrinthodon* figured by Prof. Jäger. All the peculiarities of the labyrinthic structure of the Keuper tooth are so clearly preserved in this specimen, that the differences are merely of a specific nature.

'At the upper part of the tooth a thin layer of enamel,* besides a coating of cement, is inflected at each groove towards the centre of the dentine; but about the middle of the tooth the enamel disappears, and the convolutions consist of interblended layers of cement and dentine. Thus, on the supposition that the tooth of the *Labyrinthodon* of the German Keuper is capped with enamel, its extent must be less than in the tooth of the Warwick sandstone.

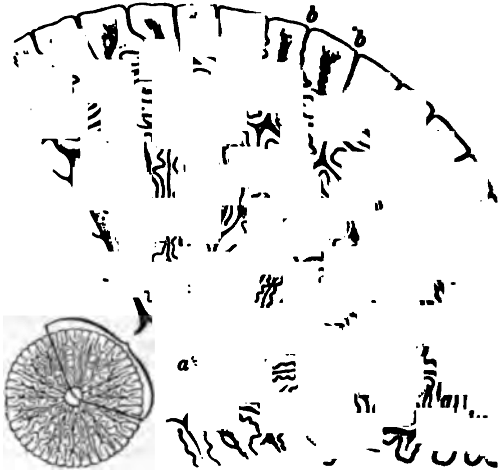
'The inflected folds are continued for a greater relative distance before the lateral inflections commence than in the German species, and the anfractuosities are fewer in number, and some of the folds are reflected backwards from near the central pulp-cavity for a short distance before they terminate.

'The modifications of the complex diverging plates of the dentine hardly exceed those of a specific character, and the dentine itself is composed of calcigerous tubes of the same relative size and disposition as in the *Labyrinthodon Jaegeri*.

'In the section taken from the middle of a smaller and relatively broader and shorter conical tooth from the Warwick sandstone, Mr. Owen found that the anfractuosities were more complicated, with numerous secondary and tertiary foldings, and the external layer of cement was relatively thicker than in the *Lab. Jaegeri*.

'The generic identity of the reptiles indicated by the teeth from the Warwick sandstones, with the *Mastodonsaurus* of the German Keuper, Mr. Owen believes to be fully established by the concordance of their peculiar dental structure above described. And in conclusion he observed, that if on the one hand geology has in this instance really derived any essential aid from minute anatomy: on the other hand, in no instance has the comparative anatomist been more indebted to geology than for the fossils which have revealed the most singular and complicated modification of dental structure hitherto known, and of which not the slightest conception could have been gained from an inve however close and extensive, of the teeth of exi mals.'

By the permission of Professor Owen we are give a section of this highly complicated elaborate *Odontography* (pl. 64, A.), in which is treated with minute detail (part ii., p. 203,



Transverse section of tooth of Labyrinthodon Jaegeri (Owen); saurus Jaegeri (Meyer): nat. size, and a segment magnified. a, from which the processes of pulp and dentine radiate; b, cement.

We have now to call the reader's attention to considerable interest, which has lately been st much care and success, and has become of as to be considered a distinct branch of inquiry name of *Ichnology*.*

This department of geological investigation is with the phenomena of footsteps impressed by the strata of the earth.

In 1828 Mr. Duncan's account of tracks and of animals impressed on sandstone in the quarry Cockle Muir, Dumfriesshire, appeared in the *Trans of the Royal Society of Edinburgh*. Dr. Buckland a living *Emys* and *Testudo Græca* to walk on clay, and paste or unbaked pie-crust. He found the spondence of the footsteps of the latter with the steps sufficiently close, allowing for difference of render it highly probable that the fossil footsteps pressed by *Testudo Græca*. In 1831 Mr. G. Poulett found, after visiting the Dumfries quarries, minute lations resembling the ripple-marks of waterupon together with numerous foot-tracks of small animals taceans probably) on the strata of forest marble [RIPPLE-MARK.] The footsteps of the so-called *rium* of Hessberg and the ORNITHICHNITES of Co are among the most interesting of the disco department.

But it is not in the older beds alone that animals have been noticed. Dr. Buckland observes, that in recent excavations for Pembray near Llanelly, in Pembrokeshire, and of large oxen have been found on clay subja bed of peat, the lower peat being moulded into similar impressions were also found upon the up of the peat beneath a bed of silt, and bones b and oxen in the peat itself. Footmarks of deer also noticed, he adds, in Mr. Talbot's excavations for bour near Margam burrows on the east of N

But we must now return to the impressions more antient strata, and to the tracks of the so-c *therium*.

In Saxony, at the village of Hessberg near Hildbur fossil footsteps were, a few years ago, discovered in quarries of grey quartzose sandstone alternating with red-sandstone, nearly of the age of the red-sandst Corn Cockle Muir. Dr. Hohnbaum and Professor state that those impressions of feet are partly partly in relief; the depressions are describ upon the upper surfaces of the sandstone slabs footmarks in relief are only upon the lo cover the depressions. In short, the foo

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* Mr. Owen has subsequently ascertained that this is not true enamel, but a layer of firm dentine, separated from the rest by a thin stratum of fine calcigerous cells.

* Ἴχνος, a footstep, and λόγος, a discourse.

casts formed in the subjacent footsteps as in moulds.
slab, six feet long by five feet wide, many footsteps
than one animal and of various sizes occur. The
npressions, which seem to be those of the hind foot,
rally eight inches in length and five in width, and
twelve inches long. Near each large footstep, and
ular distance (about an inch and a half) before it, a
print of a fore-foot, four inches long and three feet
curs. The footsteps follow each other in pairs, each
the same line, at intervals of fourteen inches from
air. The large as well as the small steps show the
es alternately on the right and left side; each step
he print of five toes, the first or great toe being bent
like a thumb. Though the fore and hind foot differ
in size, they are nearly similar in form.

name of *Chirotherium* was proposed by Professor
s the provisional name for the great unknown ani-
t impressed the larger footsteps, from a supposed re-
ice in the marks of both the fore and hind feet to
ress made by a human hand; and he thought that
ght have been derived from some quadruped allied
larsupialia. Dr. Siekler, in a letter to Blumenbach
gave a further account of these footsteps. Fragments
were found in the quarries where the footsteps had
ressed, but those fragments were destroyed.

uckland (*Bridgewater Treatise*) expresses his opi-
t the presence of two small fossil *Mammalia* related
possum, in the oolite formation of Stonesfield [MAR-
A, vol. xiv., p. 464 et seq.], and the approximation
rder to the class of reptiles, are circumstances which
bability to such a conjecture. Dr. Buckland further
that in the Kangaroo the first toe of the fore foot is
uely to the others, and that the disproportion be-
he fore and hind feet is also very great; and he
several specimens of these footsteps. (*Bridgewater*
, pl. 26′, 26″, 26‴.) In his description of the plates,
kland remarks that M. Link has made out the foot-
four species of animals in the Hildburghausen sand-
nd that it has been conjectured that some of these
en derived from gigantic Batrachians. He further
es the footsteps figured by him in pl. 26‴ as those
ll webb-footed animal, probably crocodilean.

hese footsteps are not confined to foreign lands,
in the last three years able observers have con-
largely to this interesting subject. Dr. Buckland
ns up the evidence obtained in this country:—'Near
ol Mr. Cunningham has successfully continued his
es begun in 1838, respecting the footsteps of *Chiro-*
and other animals in the new red-sandstone at
Hill, on the west side of the Mersey. These foot-
cur on five consecutive beds of clay in the same
the clay-beds are very thin; and having received
ressions of the feet, afforded a series of moulds in
asts were taken by the succeeding deposits of sand,
verted into sandstone. The casts of the feet are
in high relief on the lower surfaces of the beds of
ie, giving exact models of the feet and toes and
these mysterious animals, of which scarcely a single
tooth has yet been found, although we are assured
vidence before us of the certainty of their existence
ime when the new red-sandstone was in process of
on. Further discoveries of the footsteps of *Chiro-*
and five or six smaller reptiles in the new red-
ie of Cheshire, Warwickshire, and Salop, have been
before us by Sir P. Egerton, Mr. J. Taylor, jun.,
ickland, and Dr. Ward. Mr. Cunningham, in a
o his paper on the footmarks at Storeton, has de-
impressions on the same slabs with them, derived
ops of rain that fell upon thin laminæ of clay inter-
tween the beds of sand. The clay impressed with
rints of rain-drops acted as a mould, which trans-
he form of every drop to the lower surface of the
d of sand deposited upon it, so that entire surfaces
al strata in the same quarry are respectively covered
ulds and casts of drops of rain that fell whilst the
ere in process of formation. On the surface of one
at Storeton, impressed with large footmarks of a
erium, the depth of the holes formed by the rain-
n different parts of the same footstep has varied
e unequal amount of pressure on the clay and sand,
lient cushions and retiring hollows of the creature's
d from the constancy of this phenomenon upon an
eries of footmarks in a long continuous track, we know that this rain fell after the animal had passed. The equable size of the casts of large drops that cover the entire surface of the slab, except in the parts impressed by the cushions of the feet, record the falling of a shower of heavy drops on the day in which this huge animal had marched along the antient strand: hemispherical impressions of small drops, upon another stratum, show it to have been exposed to only a sprinkling of gentle rain that fell at a moment of calm. In one small slab of new red-sandstone found by Dr. Ward near Shrewsbury, we have a combination of proofs as to meteoric, hydrostatic, and locomotive phenomena, which occurred at a time incalculably remote, in the atmosphere, the water, and the movements of animals, and from which we infer, with the certainty of cumulative circumstantial evidence, the direction of the wind, the depth and course of the water, and the quarter towards which the animals were passing: the latter is indicated by the direction of the footsteps which form their tracks; the size and curvatures of the ripple-marks on the sand, now converted to sandstone, show the depth and direction of the current; the oblique impressions of the rain-drops register the point from which the wind was blowing at or about the time when the animals were passing.'

The *Address* from which the above passage is taken was delivered at the anniversary of the Geological Society of London, on the 21st February, 1840; and at that time all was conjecture as to the nature of the animal called *Chirotherium*. Professor Owen's paper, read on the 20th January in this year, the abstract of which is given above, proved the existence of a gigantic Batrachian at the period when the new red-sandstone was formed. Scarcely was that memoir communicated, when additional materials of the highest importance were brought forward by the liberal possessors of them, and the result was a second paper, read before the Geological Society of London on the 24th of February last, in which three species of *Labyrinthodon* were defined, and evidence relating to the ichnology of those extinct Batrachians was adduced, which may be briefly stated as follows:—

1st. Proof from the skeleton that *Labyrinthodon* had hind extremities much larger than the anterior extremities.

2nd. That the foot-prints of *Chirotherium* are at least as much like those of certain Toads as those of any other animals.

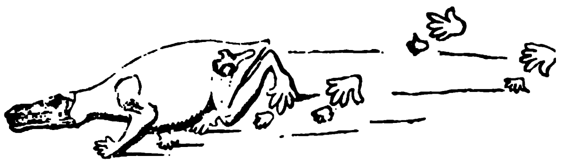
3rd. That the size of the known species of *Labyrinthodon* corresponds with the size of the foot-prints of the different species of *Chirotherium*: *e.g.* *Labyrinthodon Jaegeri*, with the foot-print of *Chirotherium Hercules* (Egerton); *Labyrinthodon pachygnathus*, with the foot-marks of the common *Chirotherium*; and *Labyrinthodon leptognathus* with the impressions of the smaller batrachian figured in the memoir by Mr. Murchison and Mr. Strickland.

4th. *Labyrinthodon* occurs in the new red-sandstone strata to which Chirotherian impressions are peculiar. And

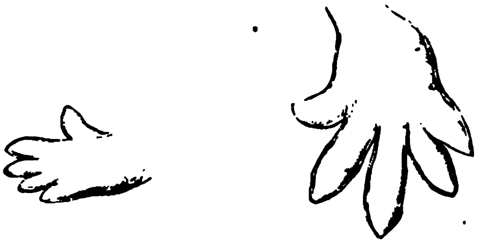
Lastly, no remains of animals that could have left such impressions as those of the *Chirotherium* have been found in these strata, except the remains of the Labyrinthodons.

It is true that the structure of the foot is still wanting, and that a more connected and complete skeleton is required for demonstration; but the circumstantial evidence above stated is strong enough to produce the conviction that Chirotherian and Labyrinthodontic foot-impressions are identical; and that *Mastodonsaurus*, *Salamandroïdes*, *Phytosaurus*, *Chirotherium*, and *Labyrinthodon* are one and the same genus, which ought for the future to be designated by the last-mentioned name. We owe this evidence principally to the use of the microscope in skilful and judicious hands; and it is impossible not to be struck with the wonderful applicability of that instrument to the largest of created bodies as well as to the smallest, when we look at the results of Professor Owen's discovery of the highly organised dental structure in *Labyrinthodon*, an extinct animal of a low grade, where it could hardly have been expected to occur.

The reading of Professor Owen's last memoir was accompanied by the exhibition of a diagram representing a restoration of two species of *Labyrinthodon*. By the Professor's kindness, we are enabled to give a greatly reduced copy of one of them. The bones which appear within the outline are those which were known when the paper was read. The animal is represented as impressing its footsteps on a shore of sand, now new red-sandstone. There is reason for believing that this formidable batrachian was not smooth externally, but that it was protected, on certain parts at least, by bony scutella.



Labyrinthodon pachygnathus.



Fore and hind foot of the same.

Specimens of the foot-prints may be seen in the British Museum and in that of the Royal College of Surgeons in London.

SALAMANDROPS, Wagler's name for the Menopome. [Salamandridæ.]

SA'LAMIS (Σαλαμίς), now Kolúri, is a small island adjacent to the coast of Attica. It forms the southern boundary of the beautiful Bay of Eleusis, and is only separated from the mainland, at the eastern and western extremities respectively, by a narrow winding channel. The bay is surrounded on the west, north, and east by the high land of Attica, of which the northern shore of Salamis seems like a continuation, and thus the bay has the appearance of a large lake. The two channels have deep water, and a vessel may enter the Bay of Eleusis through them with any wind.

The form of the island is very irregular. On the west side it is indented by the deep Bay of Koluri, on which the village of Koluri stands, and on the east side a long narrow peninsula projects towards the coast of Attica. Its greatest length from north to south is about ten miles, and the longest line than can be drawn in the island, from about east to west, is a little more; but the area is probably not above 50 square miles. The soil, though scanty, is productive; and some districts are well suited to the olive. It produces good honey, and with proper care excellent wine might be made. There is only one stream in the island, which enters the sea on the south-west coast, and is probably the Bocaros or Bocalias of Strabo. The village of Koluri, with two others called Mulki and Ambelákia (vineyards), and a convent, contained a few years ago the whole population of the island.

The old city of Salamis, which was deserted in the time of Strabo, stood on the south coast opposite to Aegina; but the city Salamis of Strabo's time was on the small Bay of Ambelákia, and near the peninsula which projects from the eastern part of the island to the shores of Attica, and terminates in Cape Cynosura. (Herod., viii. 76.) This cape was also called Sileniae and Tropaea. About midway between this peninsula and the Piraeus, but not exactly in the strait leading to the Bay of Eleusis, is the small island of Psyttaleia, now Lipsokutáli, which makes a conspicuous figure in the battle of Salamis. (Herod., viii. 95.) It is about a mile long, and from two to three hundred yards wide, low, rocky, and covered with shrubs. Between the Bay of Koluri and the strait at the western extremity of the island there is a mountainous peninsula called Budorus by Thucydides (ii. 93, 94) and Strabo. The western extremity of the peninsula is only three miles from Nisæa, the port of Megara.

The antient names of Salamis were Sciras and Cychreia, derived from antient heroes. It was also called Pityussa from the pines that grew in it. In Homer, the island is only called Salamis, a name said to be derived from Salamis, the mother of Asopus. Before the Trojan war, the island was possessed by the Aeacidae under Telamon from Aegina; and Ajax, the son of Telamon, accompanied the expedition to Troy with twelve Salaminian ships. About the time of Solon and Pisistratus, there was a dispute about the island between Megaris and A[illegible] nated in favour of Attica, and from that [illegible] came one of the Attic demi. In the con[illegible] sander and the Athenians, the Sal[illegible] their island to the Macedonians, for [illegible] ished by the Athenians, who destroyed [illegible] time of Pausanias it was in a ruined [illegible] trace the remains of the agora, and there was a t[illegible] Ajax with a statue of ebony.

The great event in the history of [illegible] battle fought B.C. 480, between the co[illegible] and the Persian fleet under Xerxes. [illegible] chiefly in the eastern strait, which, bei[illegible] was very unfavourable to the enormous [illegible] According to Heredotus, the Greek fleet [illegible] triremes and five penteconters. The Pers[illegible] by various antient authorities at 1200 ships, [illegible] bably somewhat less. The Persian king saw the [illegible] the Attic coast, where he had his seat at the foot [illegible] Aegaleos, with his secretaries by his side to [illegible] events of the action. (Herod., viii. 90.) T[illegible] position of the Persian king, according to Leake, was [illegible] shore, 'on the summit of a ridge which descen[illegible] of Mount Aegaleos, about a mile from the [illegible] Port Phoron, and opposite to the centre of the [illegible] The result was the complete defeat of the [illegible] ment. After making a feint to build a mole fr[illegible] land to Salamis, as if he wished to shut up the [illegible] which had retired into the bay after the [illegible] suddenly ordered his fleet to retreat to the H[illegible]

(Herodotus, viii.; Aeschylus, *Persae;* [illegible] p. 393; Pausanias, i. 35; Leake, *On the Demi of Attica;* and the articles Aeschylus, Aristides, Themistocles, and Xerxes.)

SALAYER ISLANDS are a small group in the Indian Archipelago, situated between 5° 40′ and 6° 20′ S. lat. and between 120° and 121° E. long. The group consists of a larger and several smaller islands. The smaller islands are uninhabited, with the exception of two called Bonaratte and Calauwe. Salayer, or the principal island, is about 30 miles long, with an average width of eight miles; and it is divided from Cape Lassoa in Celebes by a strait about eight miles wide. In the strait there are three small rocky islands, called the Budjeroons, which are uninhabited.

A ridge of high hills traverses the island from north to south, and descends to the east and west with a rapid slope. These hills are entirely covered with wood, and abound in deer. Along the base of the hills there are tracts of low land, which are carefully cultivated. They produce several roots and grains common in the archipelago, but especially *botta*, a kind of millet, which constitutes the chief article of food of the inhabitants. Cotton is also grown to a great extent, and the inhabitants manufacture it into coarse cloth, striped blue and white, which is partly used in the island and partly exported. Among the trees there are several kinds of palms, and also the tallow-tree, the substance obtained from which is used for burning, as it is in China. The inhabitants, who are stated to amount to about 6[illegible], are Malays, and seem to be more industrious than the natives of other islands, as they apply themselves to agriculture, and, as already observed, manufacture cotton stuffs. The island is divided among several petty princes, who are dependent on the Dutch at Macassar, but it seems that they are not bound to any other duty than to resort every year to Fort Rotterdam to perform the customary ceremonies of vassalage. On the eastern side of the island the Dutch have a small fort, or rather a redoubt, called Fort D[illegible] (Stavorinus's *Voyages to the East Indies.*)

SALDANHA BAY is a spacious bay on the [illegible] shore of South Africa, about 70 miles north of T[illegible] between 33° 3′ and 33° 20′ S. lat. and near 18[illegible] This bay is about 15 miles in length from n[illegible] to south-south-east, and it affords at all [illegible] shelter and anchorage. It is divided from [illegible] a ridge of granite rocks of moderate elevation, [illegible] there is an opening about three miles wide, [illegible] trance to the bay. There are two small rocky [illegible] entrance, and the channel for vessels lies [illegible] The bay contains several excellent ancho[illegible] the north and south, and also along the [illegible] separates the bay from the sea. The [illegible] bay is of moderate fertility; but bei[illegible] bited and cultivated, all kinds of pr[illegible] tained. (Morell's *Narrative of Four Voyages to the South Sea*, &c.)

SALE is that transaction by which the ownership of property is transferred to the buyer, in consideration of a money payment by him, or on his behalf, to the seller. Such transfer of ownership may sometimes be made, although the property does not belong to the seller; as in the case of sales in open market, which are valid, though made by parties wholly without title to the property, or authority to sell it; and sales by factors and agents duly authorised. Under the present head it is proposed to treat only of the law relating to the ole act of sale, it being assumed that the parties to the are legally qualified to effect it. Persons in certain con ns are by law in some cases restrained and in others oled from buying and selling, but these restrictions and disabilities form no part of the law of sale; they belong rather to those branches of the law, such as infancy, bankruptcy, insolvency, coverture, lunacy, alienage, &c., which create and define them.

Generally, all things may be the subject of sale; but there are some exceptions,—such are a mere title to lands of which a party is not in possession, a presentation to a living actually vacant, the pay of a naval or military officer, and some other things.

Property is distributed under the two heads of real and personal property, which differ materially in many respects; and the modes of effecting the sale of each of these kinds of property likewise materially differ. Some incidents however are common to a sale both of real and personal property.

No sale is valid so as to be capable of being enforced unless—

1st, The parties to it act with good faith;

2nd, Unless there is consent in each of them; and—

3rd, No sale is valid the subject of which is illegal, or which involves an illegal transaction, or has for its object an illegal act.

With respect to the first principle, it is a maxim of the common law that fraud vitiates all contracts. The fraud may be, with respect to the property, the subject of sale, either of a positive character, such as wilful misdescription of it in material particular by the seller, or negative, such as ned concealment of defects and incumbrances. In these cases the contract of sale cannot be enforced, notwithstanding express stipulations that the property shall be taken with all its faults, or that mistatements shall not invalidate the sale, but shall be provided for by compensation.

What is a material particular, will of course depend upon the subject-matter of the sale and the circumstances of the case. A misdescription of the situation of an estate, a t that a public-house which was bound by covenant to purchase beer of a particular brewer, was a free public-house, that a long leasehold estate was freehold, have been held to be material. Under this head may be adduced as an instance the employment of more persons than one to make false biddings at an auction on behalf of the seller. h persons are commonly called puffers. One such per- may lawfully be employed to protect the interests of the owner by merely buying in the property at a predetermined n. But the bidding of more than one has the effect of producing an incorrect opinion as to the value of the estate, and such bidding, being fraudulent, invalidates the sale. In like manner fraud on the part of the buyer will have same effect; as where he prevents other persons purchasing by fraudulently misrepresenting the re of the property, or attempts to obtain possession with a design not to pay for it; or where, when ciating the sale, he knows himself to be insolvent, kes payment by cheques or bills which he knows will be honoured, &c. These are instances of fraud which is nded to operate only on one of the parties to the sale. But same effect may be produced where the fraud is intended to operate on other persons not parties to the sale; as where is attempted to be made by a seller for the purpose defrauding his creditors. If in such case the buyer par- te in the fraudulent intention, the sale will be invalid. an action at law, the question whether fraud has existed to be determined by the jury.

2. There must be consent in each of the parties to the sale. This rule involves the proposition that each must be free and intelligent agent: no sale therefore can be valid re either of the parties was under coercion by violence or risonment, or bodily fear, or was lunatic, or idiot, or utterly ated. Again, in order that a buyer may be a legally consenting party to a sale, he must be truly informed in all material particulars as to the property which is the subject of sale. This must be understood of such particulars as he cannot by reasonable care and observation inform himself upon, for a man has no legal protection against the consequences of his own carelessness and negligence. If however he has been deceived in any other particulars, even unintentionally, by the buyer, he cannot be said to consent to the bargain. The consent which he gives is to the purchase of such property as has been described to him, and the consent therefore cannot relate to the property which is the subject of the sale, if it differs in material points from what has been described. Thus in the common case of a horse warranted sound, the consent is to buy a sound horse, and the buyer cannot be considered to have consented to buy an unsound horse. If therefore the horse is manifestly unsound, a party cannot be compelled to carry into effect his contract to purchase it. The case is the same with an estate said to be tithe free, which in reality is not so, or with any other property the description of which, as stated, varies materially from the truth. Where indeed the variance from the description is obvious, and the buyer has had an opportunity of inspecting the property and afterwards chooses to complete the purchase, the contract will not be invalid. The reason of this rule is manifest, for the legal presumption is that ordinary diligence has been used, where it might and ought to have been used, and there is therefore no ground for supposing an absence of the buyer's consent.

In cases where there is no fraud, and a possibility of variance from the description is contemplated in the conditions of sale, the sale may still be valid notwithstanding the existence of such variance, for in this case both parties knowingly take the chance of the variance being either favourable or adverse to them. As when for instance it is stated that an estate consists of so many acres, &c., be the same more or less, &c. If the conditions of sale contain a provision that compensation shall be made for such variances when they are ascertained, then the party in whose favour they turn out to be, will be bound to make such compensation. If however from the circumstances of the case it should appear that such compensation cannot be made, the sale cannot be enforced against the purchaser, forasmuch as the terms to which the parties consented are impossible, and there is therefore nothing to which the consent is applicable.

A court of equity will in some cases compel a buyer to complete his bargain, on the condition of the seller making him compensation in respect of those matters in which there is a variance, even although there is no provision to that effect in the conditions of sale. The principle on which this is done is, that parties ought to carry into effect what was substantially their intention. This power of the court therefore is not exercised where the variance is material, or where the attainment of the particular matter in which a variance exists really was the main object of the purchase. The common terms of exaggerated praise in which persons speak of the property that they have to sell, is not such misdescription as will make a sale void. In cases where property is agreed to be sold by one contract, in one lot, a buyer cannot be compelled to take some part of it without the rest.

3. No sale is valid if the subject-matter of it is illegal or prohibited, or if an essential part of it is an illegal transaction or involves an illegal act. A sale of treasonable, blasphemous, or obscene publications is void, for the acts of treason, blasphemy, and obscenity are legally punishable. A sale of property known by the seller to be intended to be used for illegal purposes is void, such as drugs to be used for the adulteration of provisions, or a house to be occupied for the purposes of prostitution. Sales for the purpose of avoiding the forfeiture to the crown incident upon judgment after a conviction for felony, are void. Sales to an alien enemy are unlawful, although a power exists in the crown to grant licences legalizing such sales. Offices of public trust, such as those which are connected with the administration of justice or government, either in the United Kingdom or in the dependencies upon it, cannot lawfully be the subject of sale. The enactments affecting the sale of various articles are too numerous to be referred to here. It may however be laid down generally that where a thing is prohibited and made unlawful by statute, a contract for the sale of such thing is void, even

although the statute does not enact that it shall be so, but only attaches a penalty to an infringement of its provisions. Sales of contraband articles are also void; and even in the case of a foreigner selling goods abroad, to be delivered in this country, the sale will be invalid, if he be cognizant of and aiding in an attempt to introduce them into this country in contravention of the revenue laws. A sale of property in the ordinary course of a party's trade is void if made on a Sunday, although the sale of the same article by another person whose ordinary dealings are not in such matters would be valid.

In the case of a sale of lands, it is assumed that the seller has a good title to them, and that he will deliver over the title-deeds to the buyer. In failure of either of these particulars the sale cannot be enforced. The right to receive a good title is one which is conferred upon the buyer by the law, independently of any agreement between the parties.

By the statute 29 Charles II., c. 3, s. 4, certain forms were required in order to give effect to a sale of 'lands, tenements, or hereditaments, or any interest in or concerning them.' Such forms are no part of the sale, which consists in the consent of parties who are competent to consent, but the statute merely declares that such consent shall, in certain cases, have no legal effect, unless the prescribed forms are observed. If an agreement for sale has been made without the requisite formalities, and has been carried into effect in some material part, a court of equity will enforce the performance of the whole contract, on the ground that the informal contract, having been partly completed, is not a case within the statute. In all other cases of contracts as to interests in land, 'the agreement, or some memorandum or note thereof, shall be in writing, and signed by the party to be charged therewith, or by some other person thereunto by him lawfully authorised.' The agreement binds the party who signs it, although it is not signed by the other party. No established form is requisite, and it is not necessary that the agreement should be contained in one instrument: it may be collected from a series of letters, or a written offer followed by a written acceptance, or from documents referred to by a letter. The signature may be attached to any part of it. An agent may be appointed verbally, and the same person may act as agent for both parties to the sale. An auctioneer is such agent, and his writing down the name of the highest bidder in his book is a sufficient signature.

The law which relates to the construction of agreements for sale falls under the ordinary rules as to the construction of agreements generally. The same observation applies as to the remedies which parties possess for the enforcement of them. When the contract for the sale of an estate is completed, the estate is, in equity, considered to be sold, and the buyer is viewed as the owner of the estate, and the seller as only a trustee for the buyer, while the buyer is considered as a trustee of the purchase money for the seller. If therefore a party has contracted for the sale of an estate of inheritance, and dies before payment of the purchase money, the money will be considered as part of his personal estate, and his executors will be entitled to it. On the other hand, if the party who has contracted to buy the estate die before it is conveyed to him, his heir or devisee will be entitled to the estate, and the executors must pay the purchase money out of the personal estate of the buyer, if they have sufficient assets. It is a consequence of this equitable doctrine, that the buyer must, as a general rule, bear any loss which happens to the estate after the completion of the contract of sale. A person who has obtained such an equitable ownership, may deal with the property in all respects as if it were his own; and such dealings, though not valid at law, are viewed as valid transactions in a court of equity.

With respect to sales of personal property, the common law required no formalities. The terms of sale might be agreed on either verbally or in writing; and they might be proved by any evidence legally applicable to the proof of other matters. Sales of goods made at one time, and not together exceeding in price 10*l.*, still remain on this footing. By the same statute (29 Charles II., c. 3) which prescribed certain formalities in sales of land, it was enacted (s. 17) that 'no contract for the sale of any goods, wares, and merchandise for the price of 10*l.* sterling and upwards shall be allowed to be good except the buyer shall accept part of the goods so sold and actually receive the same, or give something in earnest to bind the bargain, or in part payment, or that some note or memorandum in writing of the said bargain be made and [illegible] charged by such contract or th[illegible] authorised.' By the 9 Geo. IV., [illegible] of this act are extended to all cont[illegible] of the value of 10*l.* sterling and upwards, [illegible] the goods may be intended to be delivered [illegible] time, or may not at the time of the contract [illegible] made or fit for delivery. The statutory [illegible] four in number:—

1. Delivery and receipt of part of the goods.
2. Payment of earnest.
3. Payment of part of the price.
4. A signature of a memorandum of [illegible] party or his agent. By the performance of [illegible] requisites the parties to the sale are bound.

If the goods themselves are delivered to the [illegible] and accepted by him, of course no que[illegible] completion of the bargain. Where how[illegible] not to him personally, many cases [illegible]ty whether or not a delivery has taken place, [illegible] to vest the property of the goods in the bu[illegible] which would be sufficient, if not afterward[illegible] by the seller, to accomplish the requisite [illegible] complete as soon as the goods have been deli[illegible] rier for the purpose of being conveyed [illegible] even although the carrier has not been selected by [illegible] But during the course of actual transit to the [illegible] cated by the buyer to the seller as the place of [illegible] the goods are subject under certain circ[illegible] of the seller to detain them. This is [illegible] stoppage in transitu, and the time and [illegible] are often a question of great nicety. [Stop[illegible] situ.] Where no delivery of part of the goods has been made by actual removal, a constr[illegible] may effect the same purpose: a delivery [illegible] of the warehouse where the goods lie: the [illegible] for their warehouse-room by the se[illegible]: the [illegible] and delivery of a bill of lading or a doc[illegible] to a wharfinger to deliver, &c., amount to a [illegible] such cases however it must be understood [illegible] is not complete if anything yet remains to [illegible] goods on the part of the seller, such as their [illegible] weighing or measurement from a larger bulk. [illegible] exercise of ownership over the goods by the bu[illegible] permission of the seller, is an act legally equi[illegible] livery: such as marking the goods, tasti[illegible] ting off the pegs from the cask, &c. But [illegible] must distinctly appear that the act which is [illegible] of ownership; if done with any other view, as for [illegible] pose merely of identifying the property, it will [illegible] afford no ground from which a delivery may be i[illegible] Where a sample is taken out of the whole bulk [illegible] very of the sample operates as a part delivery.

2. The earnest-money paid must be retained. In a [illegible] where a shilling had been paid to bind a [illegible] was returned, it was held that this was not [illegible] with the requisite of the statute.

3. The part payment need not necessarily be [illegible] cash; a payment by acceptance of a bill, or by a [illegible] note, will, while the instruments remain und[illegible] have the same effect as by actual money.

4. The general observations which have be[illegible] a note or memorandum in writing relative to [illegible] will apply equally to one relative to sales of [illegible]

(Sugden, *On the Law of Vendors and* [illegible]: *Treatise on the Law of Vendors and Purchasers* [illegible] *sonal Property*.)

SALE, GEORGE, a learned oriental scholar, [illegible] in 1680. Very little is known of his private l[illegible] he was a lawyer. He was a contributor [illegible] versal History,' edited by Swinton, [illegible] others, and he wrote for that work [illegible] sides several valuable fragments of Or[illegible] which he was deeply versed. He was lik[illegible] authors of the 'General Dictionary' (Lond., 17[illegible] 4to.), which contains a translation of that of [illegible] the work by which he is best known is a trans[illegible] Korán into English, from the original A[illegible] natory notes and quotations from Zama[illegible] and the most approved commentators. [Kor[illegible] version, which in point of fidelity will [illegible] with the excellent Latin translation by [illegible] in 1698, Sale prefixed a preliminary [illegible] ial and religious state of the Arabs, Jews, and Christians t the time of Mohammed's appearance [Mohammed]; on he doctrines inculcated in the Korán; on the principal ects among the Mohammedans; and on various other subects connected with Islám (Lond., 1734, 4to.). This disourse was afterwards translated into French, and prefixed o the French version of the Korán by Duryer (Antw., 1770, vols. 8vo.). Sir James Porter, in his 'Observations on the eligion, Law, Government, and Manners of the Turks' Lond., 1768, p. 60), has accused Sale of making an apology or the Korán, rather than trying to point out the perniious doctrines contained in that book. The charge hower is wholly groundless, as every scholar acquainted with he writings of the Mohammedan divines will readily admit. ale was one of the founders and a member of the first comittee of a Society for the Encouragement of Learning, intituted in 1736. He died in the same year (14th Nov., 1736), aving one son. Soon after his death a catalogue of his riental MSS. was published, containing many choice artiles in Arabic, Persian, and Turkish literature. They are ll now in the Radcliffe Library, Oxford, for which they ere purchased.

SALEM, a sea-port town, the capital of Essex county, n the state of Massachusetts, North America, is situated n a tongue of land formed by two inlets of Massasetts Bay, called North River and South River. A dge 1500 feet long crosses North River, and connects alem with the village of Beverley. Salem is in 42° 36′ . lat., 71° 7′ W. long., 15 miles north-east from Boston. t is the oldest town in the state except Plymouth, having een founded in 1628, and for some time contended with oston for commercial supremacy, but was soon compelled yield to its powerful neighbour. The population was 2,731 in 1820, 13,886 in 1830, and 15,162 in 1840.

The town is well built, the old houses chiefly of wood, e modern ones of brick; and though the streets are rather arrow, there is an appearance of much neatness and comrt. There is a court-house, a market-house, a gaol, and n almshouse, all well built and spacious. The East India arine Museum has an extensive and interesting collection curiosities from all parts of the world. It belongs to the ast India Marine Society, of which no one is eligible to be member who has not sailed round Cape Horn or the Cape of ood Hope, and which was founded in 1801, for the purpose affording relief to indigent members and their families, and so to promote the trade to the East Indies. The chief anufactures of Salem are leather and ropes, and there are rds for ship-building. In 1832 there were 8 banks, 5 surance companies, and an institution for savings; 2 liraries, an Athenæum, and a mechanics' library; 3 semieekly newspapers and 2 weekly; and 15 places of worship. ducation is much attended to; there are numerous schools, d no child in the town need remain uninstructed.

The harbour is in South River; the anchorage is good, ut the depth of water at the wharfs is only 12 or 14 feet. he trade is chiefly with the East Indies, in which a large apital is employed. The number of vessels employed in trade in 1818 was 53, carrying 14,272 tons.

Salem is the name of 18 small towns and villages in the nited States of North America, including New Salem and st Salem.

SALEP, *Salap*, or *Saloop*, a nutritious article of diet, h valued in the East for its supposed general stimuproperties, but which is justly esteemed as bland and tritious, and well suited to children and convalescents. p consists of the tubers of different species of Ordeæ, which have been known in medicine from very arly times by the name Orchis. Dr. Royle has most recently treated of the plants yielding Salep, in his 'Illustr. Himal. Botany,' and in the 'Proceedings of the oyal Asiatic Society.' He states that the accounts of heophrastus and Dioscorides are repeated in the works of he Arabs, who describe Salep under the names of *khusyut-sálib* and *khasyut-al-kulb*, which names are literally anslations of testiculus vulpis and testiculus canis; to he above they assign as Greek synonyms *orkhis*, *saturyoon*, nd *turphyla*, evidently intended for the ὄρχις, Σατύριον, nd τρίφυλλον of Dioscorides. In India these tubers are nown by the name *salip misree*, that is, salep from Misr, r Egypt, all which names appear to be derived from he Arabic *salib;* whence, Dr. Royle states, it might be nferred that the knowledge of this substance was first erived from the East, but on examining the accounts in Arabian authors on 'Materia Medica,' we see the names and descriptions are mere translations of those of Dioscorides. If the Greeks were the first to use the tubers of some of the Orchideæ, either as articles of diet or in medicine, some European species would probably be the plants which yielded the original salep, and possibly some of those which have been found to afford it of good quality to experimenters in the present day. Sprengel considers Orchis papilionacea, Lin., to be the orchis (ὄρχις) of the antients, as it is called *salepe* (σαλεπι) by the modern Greeks; M. Beissinhirtz says that Orchis Morio, mascula, and militaris give the best salep in Europe; O. maculata and latifolia are rather inferior in quality. Dr. Cullen says, 'I have seen it prepared in this country from Orchis bifolia, as pure and as perfect as any that comes from Turkey.' But all the European saleps are far inferior to and considered only as indifferent substitutes for that brought by commerce from the latter country, though the place and plant yielding it are unknown.

Though the Arabs may have copied the descriptions of Greek authors, it is probable that the substance was known to eastern nations independent of all western intercourse. It is highly valued in India, and forms an article of commerce from Caubul and Cashmere to the north-western provinces of India, where it is sold, at the Hurdwar fair held in April, at a high price, sometimes as much as 40 rupees, or 4*l.* a pound. This is very similar in form and appearance to Turkey salep, though the tubers are twice as large as the best procurable in London.

The plant yielding the Cashmerian salep has not been yet fully described, but Dr. Royle obtained specimens of the tubers with the plant (not in flower) attached to them in 1836, from the vicinity of the hills near the Jhilum, on the road from Northern India to Cashmere. This plant he has named Eulophia vera. Another species, E. campestris, found in the jungly plains at the foot of the Himalayas, yields tubers which are collected by the natives and sold as a substitute for salep misree. Another plant, supposed to be E. herbacea, yields another variety of salep in the Himalayan Mountains; of the former, Dr. Royle states, that having obtained some of the tubers and prepared them as salep, that is, scalded them in boiling water and then carefully dried them, he found they had a considerable resemblance to the salep of commerce, and when prepared as arrow-root or gruel, afforded a very agreeable and nutritious article of diet, similar to that obtained from the commercial salep.

Salep consists of the dried tubers of several orchideous plants, chiefly of the genus Orchis, as O. moris, O. mascula, O. maculata, &c., and from some species of Eulophia. All these plants have two tubers, charged with nutritious matter, and while one is nourishing the flower-stem and seeds of the current year, by which it is robbed of its store, the other serves as a reservoir for the flower-stem of the succeeding year. This last alone is fit for use. Both are dug up together, but the solid one only is retained. It is dipped in warm water, after which the fine brown skin is easily removed by means of a coarse cloth or brush. 'The tubers, being thus cleaned and peeled, are to be arranged on a tin plate, and then placed within an oven heated to the same degree as is necessary for baking bread; here they are to remain for seven or ten minutes, in which time they will exchange their opaque and milky whiteness for a semi-transparent horn-like appearance, and a yellowish colour, retaining their original bulk. Being then withdrawn from the oven, they are exposed during some days to dry and harden in the air; or by the employment of a very gentle heat, they may be brought to the same state in the course of a few hours: all that is then required to adapt the salep for food is to boil it in water (or milk) to the required consistency.' (*Library of Entertaining Knowledge*, 'Vegetable Substances: Food of Man,' p. 159.) In Armenia the tubers, while yet soft, are strung together on threads, and suspended in the sun, which is sufficient to dry them without artificial heat. The chemical composition of salep varies according to the period of the growth when the tubers are taken up. Though salep is regarded as a variety of starch, there is very little pure starch present, the chief constituent being that form of gum termed *bassorine*. With cold water salep very slowly swells and forms a mucilage; but one part of salep-powder with forty-eight parts of water boiled or heated forms a thick mucilage, which has very peculiar qualities, inasmuch as with either calcined magnesia, bisulphate of quinia, or biborate of soda, it thickens into a solid glue-like substance. This may be of service in the arts. But the chief use of salep is as a mild and digestible article of food: and as the orchis abounds in our meadows, a large supply of nourishment might be obtained by digging up the tubers and drying them, as above stated, and as was recommended in the last century by Dr. Percival (*On the Preparation, Culture, and Use of the Orchis-root*, 1773). In that work it is stated that salep has the property of concealing the taste of salt-water (see also *Philos. Magazine*, vol. xviii., 161); 'a property,' observes Sir Whitelaw Ainslie, 'which might be turned to good account in long voyages; the mucilage is best to be used for this purpose' (*Materia Indica*).

Salep is composed chiefly of bassorine, some soluble gum, and a little starch; by some it is considered as containing the largest portion of nutritious matter in the smallest space.

SALERNITA'NA SCHOLA, or *School of Salerno*, the earliest school in Christian Europe where medicine was professed, taught, and practised. Salerno, from its connection with Constantinople and the Saracens, became the centre of the united learning of the Latins, the Greeks, and the Arabians; and hence it was one of the first cities in Europe where the sciences awoke from the slumber of barbarism. Amongst other arts, it was celebrated very early for the profession of medicine,[*] and its first fame was derived from the extraordinary cures said to have been performed by the relics of Saint Archelais. This lady, with two other holy virgins, Thecla and Susanna, suffered martyrdom in the persecution of Diocletian, about the year 293, and their remains were at length deposited in the church of the Benedictine nuns of Saint George at Salerno. (Anton. Mazza, *Histor. Epit. de Rebus Salern.*, Neap., 1681, 4to., cap. vi.) In an antient chronicle, quoted by Mazza, it is said that the first founders of the school of Salerno were Rabinus Elinus, a Jew; Pontus, a Greek; Adala, a Saracen; and Salernus, a Latin, who taught medicine in their respective languages, but at what æra is not mentioned. (Anton. Mazza, *Salern. Hist.*, cap. ix.) Though medical works had never been wanting in the dark ages, and the works of Hippocrates and Galen were translated into Latin as early as the sixth century,[†] yet this art was principally derived from the Arabians, who likewise learned it from the Greeks. After that warlike people had softened into habits of peace and luxury, by the encouragement of their khalifs, and particularly of Al-Mamoún, at the beginning of the ninth century, they applied themselves to learning. Many of the Greek writers were translated into Arabic; and the philosophy of Aristotle, and the art of medicine of Hippocrates and Galen, became their favourite studies. In their frequent visits to the port of Salerno, the knowledge which they freely communicated was eagerly received there and diligently cultivated. For many centuries the most able professors of medicine were the higher prelates and the superior monks.[‡]

Connected with the city of Salerno by its vicinity, and the similarity of its literary pursuits, was the monastery of Mount Casino. Here and at Salerno great progress in the sciences had been made, when the arrival of Constantinus Afer commenced a new æra of learning and fame. This celebrated man was born at Carthage. After thirty-nine years spent in study at Bagdad and in travel, he returned to his native country, master of all the learning then current in the world, and particularly of medicine. His talents excited the jealousy of his rivals, he was obliged to fly, and took refuge at Salerno in 1060. He was discovered by the brother of the khalif of Egypt, who happened to be in that city, and who recommended him to Robert Guiscard. By this prince he was patronised, and made his secretary. Having been converted to Christianity, he became a monk, and retired to the monastery of Mount Casino about the year 1075, where Desiderius was the abbot. He died in 1087, after having, by his wonderful cures, the multitude of books he wrote, and the number and fame of his scholars, raised the reputation of the School of Salerno to the greatest height. Some of his works have been printed (Basil., 1536, 1539, 2 vols. fol.), and others remain in manuscript.[*] The names of few of his disciples have been recorded. We find mention however of Atto, chaplain to the empress Agnes, who translated the works of his master from various languages into Latin. (Pet. Diac., *De Viris Illustr.*, cap. xxix.) Another of his pupils was John, the physician, an eloquent and learned man, who published a book of aphorisms, and died at Naples, where he deposited the books written by his master. Gariopontus seems likewise to have been a contemporary. (Moreau, *Prolegom.*, p. 11.) It may not be uninteresting to ascertain the other celebrated physicians of Salerno in the twelfth century, and soon after the time when the 'Regimen Sanitatis Salernitanum' was written. The earliest whose name occurs is Nicolaus, who, amongst other works, wrote a book, still extant, entitled 'Antidotarium,' upon medicines, which was thought to have been the summit of medical knowledge. [NICOLAUS PRÆPOSITUS.] It was commented upon by John Platearius, in the middle of the twelfth century, and many other writers. Musandinus wrote upon diet, Maurus upon urine and phlebotomy. The specific works of John Castalius, Matthew Solomon, and Ricardus Senior are not enumerated. There were other learned men who studied medicine at Salerno in that century, but removed to other places, such as Saint Bruno, bishop of Signia, afterwards abbot of Casino, and again bishop, who died in 1126: Romualdus the second, archbishop of Salerno from 1157 to 1181, who attended William, king of Sicily, as his physician, in 1127; Saladinus Asculanus, physician to the prince of Tarentum in 1163. (Ægidius Corbol.; Petrus Diac.; Mazza; &c.) Nor was the healing art confined to men only: there were many of the fair sex who were celebrated for their medical skill. The time when most of them lived is uncertain, but probably in the eleventh, twelfth, and thirteenth centuries. Ordericus Vitalis speaks of a woman unequalled in medicine in 1059: 'Rodulfus cognomento Mala-Corona, Physicæ scientiam tam copiose habuit, ut in urbe Psalernitanâ, ubi maximæ medicorum scholæ ab antiquo tempore habentur, neminem in medicinali arte, præter quandam sapientem matronam, sibi parem inveniret' (*Hist. Eccl.*, lib. iii., ad an. 1059, p. 477). Abella wrote a poem in two books, 'De Atrabile et de Naturâ Seminis Humani.' Mercurialis composed books 'De Crisibus,' 'De Febre Pestilenti,' 'De Curatione Vulnerum,' 'De Unguentis.' Rebecca, a work 'De Febribus, de Urinis, et de Embryone.' Trotta or Trottula's book 'De Mulierum Passionibus ante, in, et post Partum' is allowed to be a forgery.[†] Sentia Guerna lectured on medicine, and Constantia Calenda received the honour of the doctorate.

It would be tedious to mention all the learned men who studied physic at Salerno after the twelfth century, of whom Mazza has given a long catalogue. From these we may however except John de Procida, a nobleman and physician of Salerno, the friend and physician of Manfred, king of Sicily, and the adviser of the Sicilian Vespers.

When the 'Regimen Sanitatis' was written, the professors contented themselves with the humble title of the School of Salerno. By the privileges of subsequent sovereigns, it was gradually constituted a regular university. Ruggiero, king of Sicily, about the year 1137, enacted a law that all who designed to practise medicine should be examined and approved by his officials and judges, under the penalty of the confiscation of all their goods. By 'officials' it is supposed that the physicians of Salerno were understood, as he had recently given great privileges to that city. The emperor Frederic II., having established likewise a university at Naples, published edicts for its government, which were finally promulgated in 1231. The study of physic and lectures in that art were restrained to those two universities. Students were to apply themselves to logic for three years before they commenced the study of medicine, which they were to pursue for five years: nor were they then admitted till they had practised for one year under an expert physician. After a public examination, the university of Salerno had full power to grant a licence to practise: that of Naples could only certify the sufficiency of the can-date to the king or his chancellor, who granted the ence. The names of 'doctor' and master were not then nown as specific titles of honour, but were used in their iginal significations for teachers or persons skilled in their t.

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[*] 'In urbe Psalernitanâ, ubi maximæ medicorum scholæ ab antiquo tempore habentur:' Orderic. Vitalis, 'Hist. Eccles.,' lib. iii., p. 477 (ed. Duchesne, Paris, 1619, fol.), ad an. 1059. 'Sin da' tempi di papa Giovanni VIII.' (pope, from 872 to 882): Giannone, 'Istoria di Napoli,' ed. Haia., 1753, vol. ii., p. 124.

[†] About the year 540, Cassiodorus recommended to his monks 'Legite Hippocratem et Galenum Latinâ linguâ conversos:' Muratori, 'Antiq. Ital.,' vol. iii., col. 930, ed. Mediol. 1740, fol.

[‡] Subsequently, by the councils of Lateran in 1139, of Tours in 1163, and the decree of Honorius III. in 1216, the clergy and monks were prohibited from exercising the professions of advocates and physicians, but they still continued the practice.

[*] His history appears originally in Leonis Ostiensis 'Chronic[illegible] Neap., 4to. 1616, lib iii., cap. xxxv.: and Petrus Diaconus, '[illegible] Casinens.,' cap. xxiii. (in 'Bibl. Max. Vet. Patr.,' tom. xxi., p. [illegible] 1677). From thence in Murat., 'Ant. Ital.,' vol iii., diss. xliv., [illegible] vol ii., p. 123; Fabricii 'Biblioth. Græca,' vol. xiii., p. 12[illegible], ed. Vet.; lioth. Med. Latin.,' vol. i., p. 1192, &c.

[†] See a dissertation by C. G. Gruner, entitled 'Neque Eros, neque [illegible] sed Salernitanus quidam Medicus, isque Christianus, auctor Libelli est [illegible] Morbis Mulierum inscribitur,' 4to., Jenæ, 1773.

The licensed practitioners took an oath to observe the gulations respecting medicines, to inform the court if othecaries did not prepare their drugs properly, and to ve advice to the poor gratis. Every physician was to visit s patient at least twice a day, and once in the night if cessary, and was not to receive for his attendance more an half a golden tarena[*] daily; or if called out of the ty, three tarenæ and his expenses, or four tarenæ to pro-de himself. He was not to undertake to cure a disorder r a specific sum, or to keep an apothecary's shop, or to be partnership with an apothecary. Surgeons were to study r one year, and to be perfect in anatomy before they were lmitted to practise. Apothecaries were to take an oath to mpound their medicines according to the forms prescribed, d for a fixed price, which for simple drugs was three renæ an ounce. Such were the regulations of the em-ror Frederic.[†] The three professions appear to have been pt distinct as early as the time of Avenzoar, who was born Seville in the eleventh century, and even in the time of lsus. (Freind, *Historia Medicinæ*, ed. Paris, 1735, 4to., 253; Le Clerc, *Hist. de la Méd.*, p. 334.) These constitu-ons, and the privileges of the university of Salerno, were nfirmed and extended by other princes, and were in force in odern times. They are the most antient medical statutes Europe, and show the state of the medical professions in ose early times. When fully established, the university nsisted of ten doctors, of whom the eldest had the title of ior. Their common seal bore the image of St. Matthew, eir patron saint, whose body had been given to them by obert Guiscard, and the inscription of 'Civitas Hippocratis.' udents were admitted to the doctorate by the solemn form having a book put into their hands, a ring on their fingers, rown of laurel on their heads, and a kiss on their cheeks. lazza, cap. ix.; Freind, *Hist. Med.*) The medical science of e Arabians, thus introduced into Salerno, was in substance at of the Greeks, from whom it was derived. In the eory and cure of diseases they followed the opinions of ippocrates and Galen; not indeed in their native sim-city, but often corrupted by their own vain and fanciful ventions, by the superstitions of astrology, and the follies alchemy. (Freind, p. 479; Gian., vol. ii., p. 119, sec. 3.) t it is admitted that the modern science of medicine owes ch to their improvements. They greatly extended the ateria Medica by the introduction of many efficacious re-dies. They added to the list of medical plants. The first t very gradual introduction of chemistry into medicine is olly theirs (as all the chemistry that is to be found in eek writers relates to the fusion or transmutation of tals), and many of their formulæ of compound medicines ll retain a place in modern dispensatories. In many ints of practice they ventured to differ from their masters, in less copious bleedings, in milder purgatives, in substi-ting sugar for honey in their syrups; and they first gra-ed the eyes and the taste of their patients by clothing eir prescriptions in gold and silver leaf—a luxury which ntinued till within the last few years.

Under the title 'Regimen Sanitatis Salernitanum,' we ssess a collection of dietetical precepts, written chiefly in tin rhyming hexameters.[‡] The poem is dedicated, by Medical School at Salerno, to Robert, son of William the nqueror, who is styled king of England, and was probably osed by a physician of Salerno, at the beginning of the nth century. Johannes de Mediolano is generally sup-sed to be the author of it, which opinion was first started, 1649, by Zacharias Sylvius, on account of some manuscripts me of them as old as 1418) which had his name in the inscrip-on; however, neither the earliest commentators and editors or the oldest nanuscripts make any mention of his name. he number of the verses varies much in different manuscripts, as the poem in the middle ages received by degrees many spurious additions. The oldest editions, with the commentary of Arnaldus de Villanova, have only three hundred and sixty-four verses, which may therefore be considered as the only genuine ones, since Arnaldus, who lived in the fourteenth century, and passed some time at Salerno, had certainly an opportunity of examining the most accurate copy of the poem. The whole work was much esteemed, not only in the middle ages, but also as late as the seventeenth century, and it is at the present time an important source of information respecting the state of medicine in that age. As it was not designed for physicians, but for an unlearned sovereign, and for general use, its object was rather the preservation of health than the cure of diseases. The means prescribed for this purpose consist in the due observation of the six non-naturals (strangely so called because they are *external*, and not parts of the *natural* body), air, food, exercise, sleep, the excretions, and the passions. To these heads may be reduced the various rules of living in a salubrious air and observing the changeful seasons; the minute detail of all kinds of meat and drink, and the qualities of herbs, which constitute the great bulk of the poem; frequent exercise and ablutions, avoiding sleep at improper times, not neglecting the calls of nature, and avoiding cares and all other violent agitations of the mind. The number of editions that have been published of this work is immense. A complete list of them is prefixed to Ackermann's edition, Stendal, 1790, 8vo.; Sir Alexander Croke's, Oxford, 1830, crown 8vo.; and in Choulant's *Handbuch der Bücherkunde für die Aeltere Medicin*, Leipz., 1828, 8vo. (from which two last works the preceding account has been principally abridged). The best commentary is that by Arnaldus de Villa Nova, which has been very frequently reprinted, and which has formed the basis of most of the editions since published. It was first published at Montpelier, 1480, 4to. Two of the most useful and valuable editions (though without the Commentary of Arnaldus) are Ackermann's and Croke's mentioned above. The work has also been translated into German, French, English, Italian, Dutch, &c.; and upon the whole no medical work appears ever to have enjoyed greater popularity.

SALE'RNO, THE PROVINCE OF, one of the administrative divisions of the kingdom of Naples, called also 'Principato Citra,' is bounded on the north by the province of Principato Ultra, west by the gulf of Salerno and by the province of Naples, south by the gulf of Policastro, and east by the province of Basilicata. The province of Salerno lies west of the central ridge of the Apennines, and between that and the coast of the Mediterranean, except a small portion which spreads along the eastern slope of the Apennines, about the sources of the river Agri. [BASILICATA.] The length of the province is about 80 miles from north-west to south-east, and its average breadth is about 30 miles. The central and larger part of the province consists of the basin of the Sele and its affluents. The Sele (Silarus) rises in the central Apennines near Conza, flows in a south-west direction, and is joined about half-way between its source and the sea by the Tanagro or Rio Negro, which comes from the south-east, and which has a longer course than the Sele itself, being joined, before its confluence with the Sele, by the Rio Bianco, which descends from the Apennines of Muro in Basilicata.

The valley of the Tanagro is bounded on the west by a detached ridge called Monte Alburno, which runs about twenty miles from north-west to south-east. West of the Alburno is the valley of the Pietra or Calore, which enters the Sele a few miles above its æstuary. The valley of the Calore is bounded to the south-west by another ridge, which rises east of Pæstum, and on which stands the town of Capaccio. South of this ridge is a fine region of hills and valleys sloping towards the coast, and extending to the south as far as the gulf of Policastro. This tract of country, which was known to the antients by the name of 'Pæstanæ valles,' is now called 'Il Cilento,' from the small river Alento which flows through it. [PÆSTUM.] The region of the Cilento is favourable to the growth of all sorts of fruit, and it contains good pasture: the inhabitants are noted for their industry and honesty. They have numerous coasting vessels, with which they trade with Salerno and Naples. This district contains many villages, and above 100,000 inhabitants. A road has been constructed of late years from Salerno to Vallo, which is the principal town of this secluded district.

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[*] A gold coin which weighed twenty grains, and would now be worth four llings and two pence. 'Quâlibet unciâ computatâ pro quinque florenis, et libet floreno pro sex tarenis, et quâlibet tarenâ pro duobus Carolinis, et libet Carolino pro decem granis.' (Ducange.)

[†] Giannone, vol. ii., p. 387. The Constitutions are in many collections; the t is F. Pauli, 'Canciani Barbarorum Leges Antiqui,' 3 vols. fol., Venice, 81, in vol. i., p. 367. See the 'Epistles of Peter de Vineis, Frederici chan-llar.,' lib. iii., epist. 10, 11, 13. The Constitution is entitled 'De Probabili perientiâ Medicorum.'

[‡] See Sir Alexander Croke's 'Essay on Rhyming Latin Verse,' Oxford, wn 8vo., 1828, and the Preface to his edition of the 'Regimen Sanitatis lernitanum.'

The town of Policastro was formerly of some importance, but being sacked and half destroyed by the Turks in the sixteenth century, it has never recovered, and is now an insignificant place. Sapri, which is farther east in the innermost recess of the gulf of Policastro, is a place of some trade, and has a natural harbour.

The southern coast of the peninsula of Sorrento, as far as Cape Campanella, belongs also to the province of Salerno. The towns of Vietri, La Scala, Positano, Amalfi, and Majori are in this district, which is remarkably populous and healthy. The inhabitants are mostly engaged in maritime trade. [AMALFI.]

A long ridge, which is an offset of the central Apennines, runs in a westward direction, dividing the province of Salerno from that of Avellino or Principato Ultra, and then running along the whole length of the peninsula of Sorrento. This ridge forms a natural boundary between the plain of Campania and the basin of the Sele. The administrative province of Salerno however includes also a district north of this ridge, extending to the banks of the Sarno. The towns of Nocera and Sarno are in this district. [NOCERA DEI PAGANI.]

SALERNO (the Roman *Salernum*), the capital of the province, and an archbishop's see, is a walled town of 11,000 inhabitants, finely situated on the sea-coast, and surrounded by a beautiful tract of country at the foot of the mountains. An old Norman castle rises on a cliff above the top. The harbour of Salerno is only suited for small vessels. Salerno has a royal lyceum, a court of justice for the province, a theatre, and many churches and convents. The most remarkable building is the cathedral, built or restored in the eleventh century, by Robert Guiscard, the Norman conqueror, who adorned it with columns of porphyry, a mosaic pavement, and other remains of antiquity which he took from Pæstum. Among the modern buildings the palace of the intendente, or governor, is considered handsome. The quay along the sea-shore is a fine promenade. An annual fair of both native and foreign goods is held at Salerno in the month of September, which is the most considerable in the kingdom, and is resorted to by all the merchants from Naples.

The other towns of the province, besides those already mentioned, are: 1, La Cava, a town of 5000 inhabitants, and a bishop's see, delightfully situated in a valley of the Apennines, on the high road from Naples to Salerno. The population is chiefly employed in manufacturing linen, silk and cotton stuffs, and pottery. The neighbouring Benedictine convent has a valuable library of MSS. and some good paintings. 2, Sarno, a considerable town in the plain of Campania, near the river of the same name, five miles north of Nocera, has several convents and churches, and about 10,000 inhabitants. 3, Eboli, in a plain south-east of Salerno, and on the high road to Calabria, where the road to Pæstum branches off to the south, is a poor town with about 5000 inhabitahts. 4, Moliterno, a town in the Apennines, on the borders of Basilicata, and near the sources of the Agri, has 6000 inhabitants, and gives the title of prince to a Neapolitan family, the late representative of which figured in the revolutions of the country at the close of the last century.

The population of the province amounts to about 513,000 inhabitants, distributed among 161 communes. Of this population about 94,000 are owners of land or houses, 233,000 are agricultural labourers, 4700 are seafaring men, 2500 priests, 1080 monks, and 980 nuns. The number of vessels belonging to the province consists of about 275, including fishing-boats. (Serristori, *Statistica d'Italia;* Petroni, *Censimento de Reali Dominj.*)

SALFORD, one of the six hundreds into which the county of Lancaster is divided [LANCASHIRE], contains seven market-towns—Manchester, Bolton, Bury, Ashton-under-Lyne, Oldham, Rochdale, and Salford; and consists of the following eleven parishes:—1, Bolton Division—Bolton, Bury, Dean, Radcliffe, Wigan; 2, Manchester Division—Beswick (extra parochial), Eccles, Manchester, Prestwich-cum-Oldham; 3, Middleton Division—Middleton, Prestwich-cum-Oldham, Rochdale. These parishes comprise one hundred townships. The district contains the following canals: the Duke of Bridgewater's, the Bolton, Bury, and Manchester, the Stockport, the Rochdale, the Worsley and Wigan, and the Leeds and Liverpool. From Manchester, which may be practically considered as its centre, railways now run in almost every direction—to Liverpool, Bolton, Leeds, Birmingham, London, Stockport, Preston. T cipal rivers and rivulets are the Mersey, Irwell, Tam lock, Irk, Roch, and Calder. The hundred is t miles in length from east to west, and nineteen i from south to north.

At the original division of parishes Salford peopled, which accounts for there being so few in crowded district. Few of the great landed proprieto in their antient mansions, most of them hav retreat where land is less valuable and rural enj less encroached on by manufacturing occupations.

There is a great contrast between this hundred time of the Conquest and at the present day. At the time it contained only the towns of Salford, Manchester, cliffe, and Rochdale. At present the whole region is co with towns and villages; and instead of sending to the council of the nation one baron, the hundred of Salfor sends ten members to Parliament, exclusive of the of the shire. In the time of the Confessor, the hun Salford, then held of the king, yielded only 37*l.* 4*s.* royal revenue; while in the year 1829 its paris townships were valued at 1,554,314*l.* per annum, 3238*l.* to the county rate, upon an assessment of o penny in the pound.

Within the last century the increase of population property in Salford hundred has been very great, chiefly to its being the great seat of the cotton-manuf In 1831 it had of families chiefly employed in agric 5130, and of families chiefly employed in trade and factures 96,172. In 1801 the population was which in 1811 had risen to 356,734, and in 1831 had re 612,414. This growth has been most decided vicinity of Manchester. The following table, exhi the rateable value in twenty different townships at different periods, shows the great increase which has place in this manufacturing district :—

Assessment for County Rate in Twenty Townsh

Townships.	Yearly Value, 1815.	Yearly Value, 1829.	Yearly
Manchester	£303,732	£371,749	£722,
Salford	47,910	100,068	160,
Chorlton-on-Medlock	19,484	66,645	137,
Ardwick	11,097	13,004	39,
Pendleton	16,425	26,833	45,
Cheetham	8,524	24,090	38,
Ashton-under-Lyne	33,548	71,637	143,
Oldham	29,970	54,799	107,
Bury	16,546	34,954	52,
Blackburn	37,624	52,073	83,
Preston	34,936	80,984	129,
Great Bolton	27,861	63,665	93,
Little Bolton	11,755	23,680	47,
Over Darwin	6,629	10,207	16,
Haslingden	8,472	11,469	17,
Crumpsall	2,910	4,933	13,
Failsworth	4,641	5,450	8,
Stretford	7,060	12,357	21,
Pilkington	12,193	26,611	32,
Prestwich	5,699	9,361	11,
	£647,416	£1,064,980	£1,928,

The increase, great as it is in the yearly value of able property in the township of Manchester, whi more than doubled since 1815, is yet in a less ratio crease than many other townships; and the amount of value of the twenty townships has ne within the twenty-five years. The aggregate value of able property in all the twenty townships (including chester) in 1815, viz. 647,416*l.*, is exceeded by the pr value of property in the township of Manchester alone, 722,640*l.*

For many years a house of correction at Hunt's Ba Manchester, now occupied as the Castle Inn, had serve a common gaol, as well for the town of Manchester the hundred of Salford; but in the year 1782 an parliament was obtained for the erection of the *New B* *Prison* on the right bank of the Irwell, and on the May, 1787, the foundations of the gaol were laid. the inscription on the foundation-stone runs th there may remain to posterity a monument of the and gratitude of this county to that most excellen who hath so fully proved the wisdom and

and solitary confinement of offenders, this prison
ıed with the name of JOHN HOWARD.' In April.
ıis gaol and penitentiary house' was opened for the
ı of prisoners.
ne of the best conducted prisons in England. The
ıre appointed by the magistrates of the hundred.
jority of male prisoners are employed in weaving,
oe making, tailoring, or on the tread-mills, of which
ı six. The female prisoners are occupied in weaving,
washing, and heading pins. The proceeds from the
ı' earning in 1835 amounted to 524*l.* In summer
ıers rise and go to work at six in the morning, and
ı their labour to the same hour in the evening, with
wance of half an hour for breakfast, an hour for
and an hour on quitting work. In winter their
' labour are regulated by the extent of daylight.
are read every morning, and divine service is per-
:wice on the Sunday. Bibles, prayer-books, and
e distributed among the prisoners by the chaplain.
month of November, 1834, the silent system was
ɜd. The gross expenditure for the year 1837-8 was
The total number of persons confined in the
the course of the year ending October, 1836, was
mely, 4783 males and 1868 females. It is capable of containing at one time 583 male and 214 female prisoners, in all 797. The average number is 700. The cost of a male prisoner is about 2*d.* a day; of a female, 1$\frac{1}{64}$*d.* a-day. For the year 1837-8 there was expended in food for the prisoners the sum of 2534*l.*; namely, for bread, meal, peas, salt, and pepper, 1734*l.*; for butchers' meat, 505*l.*; for potatoes 295*l.* From Jan. 1794 to Jan. 1838, there were 94,340 persons committed. The sum paid in salaries for the year 1835 was 2231*l.* 14*s.* 6*d.* By a return of prisoners in the New Bailey, who are known to have been at large committing depredations for the time specified, it appears that 40 thieves had been plundering for a year, 50 for two years, 17 for three years, 10 for four years, 5 for five years, 1 for six years, 3 for seven years, and 1 for nine years;—total 127 prisoners. The average duration of each prisoner's career of depredation before the imprisonment is two years and three months. Juvenile delinquency abounds in the district. The number of offenders of twenty years of age and under who annually pass through it is 1000, but the number brought before the magistrates in one year is 4000. The crime which these numbers indicate is however committed by a comparatively small number of persons, and by the same round of offenders. The following tables give valuable information on this important subject.

, *Sex, Offences, Degree of Education, and Result of Trial of the Prisoners of Twenty Years of Age and ler, committed to the New Bailey Sessions, from the* 17*th of October,* 1839, *to the* 24*th of February,* 1840, *ng the result of Four Sessions held during that period.*

	Offences.																Degree of Education.				Event of Trial.												
																					Imprisonment.								Transportation.				
	Felony.		Shop-lifting.		Picking Pockets.		Burglary.		Highway Robbery.		Obtaining Money or Goods under False Pretences.		Receiving Stolen Property.		Total.		Neither Read nor Write.	Read or Write Imperfectly.	Superior Education.	Unknown.	1 month and under.	2 months.	3 months.	4 months.	6 months.	7 months.	10 months.	18 months.	7 years.	14 years.	15 years.	Life.	Acquitted.
	m	f.	m	f.	m	f.	m	f.	m	f.	m	f.	m	f.	m	f.																	
ler							1								1		1							1									
	1						1								2		2				1		1										
	9	1	1				1								11	1	10			2	2	2	4		1								3
	4	2	1				1								6	2	6	2			2		3	1	1					1			
	13	1	2			1	2					1			17	3	15	5			3	2	7		2								6
	2	1			1		3								6	1	5	2			1		4			1	1						
	9	3	2				2								13	3	6	9		1	1	2	3	1	3			1	1				4
	6	4			3	1	1								10	5	6	9			1	1	3	1	3		1		1		1		3
	14	2							4			4	1		19	6	10	8		7		6	9	4					1	1			4
	7	1			1	1									8	2	4	6					5	1	2				1				1
	65	15	6		5	3	12		4			5	1		93	23	65	41		10	11	13	39	9	12	1	2	1	4	2	1		21

yf Juvenile Delinquents committed to the New Bailey Sessions, from December, 1834, *to December,* 1839, *inclusive, being five years.*

SEX AND AGE.								Total Male and Female.	EVENT OF TRIAL.										
									Imprisonment.				Transportation.						Acquitted, or bills cut.
Total Male.	Under 10 years of age.	10 and under 15.	15 and under 20.	Total Females.	Under 10 years of age.	10 and under 15.	15 and under 20.		Under 6 months.	6 months and under 12.	12 months and above.	Total Imprisoned.	7 years.	10 years.	14 years.	15 years.	For life.	Total transported.	
277	1	56	220	46		3	43	323	171	38	4	213	48		24		4	76	34
266	1	50	215	78		3	75	344	181	61	11	253	31		16		1	48	43
309		45	264	71		6	65	380	230	42	10	282	49	5	3		6	63	35
319	3	62	254	88		8	90	407	237	63	13	313	30	11	5			46	48
276	4	49	223	59	1	11	47	335	179	43	25	247	36	7	2	1		46	42
1447	9	262	1176	342	1	31	310	1789	998	247	63	1308	194	23	50	1	11	279	202

SALFORD, a market-town in the parish of Manchester and hundred of Salford, is divided from Manchester by the river Irwell, over which there are five bridges from one place to the other. Till the passing of the Reform Act it was considered as little more than a suburb of Manchester, with which it is still intimately connected by commercial, social, and domestic relations. It is now however a large, populous, and improving town, having its own municipal government, and returning a member to parliament. Salford may be viewed either as a township in the parish of Manchester, or as a borough comprising three other townships.

In 1773-4 an enumeration of the houses and inhabitants in the town and parish of Manchester was taken from an actual survey, and deposited by Dr. John Whittaker, April 27, in the college library. [MANCHESTER.]

	Houses.	Families.	Males.	Females	Married.	Wives.	Widows.
Manchester	3402	5317	10,548	11,933	7724	432	1064
Salford	866	1099	2,248	2,517	1775	89	149

In 1801 the population of the township was 13,611, and in 1831 it had reached 40,786.

History.—According to Whittaker, Salford signifies the Sal or Hall at the Ford, that is, the passage across the Irwell near which the mansion of the thane was situated. It gave its name to the hundred, of which originally it was the head. On the general partition of the country, the hundred was retained by the crown, and for this reason the town of Salford has ever been independent of the Lord of Manchester, and continues to the present time annexed to the duchy of Lancaster. In lieu of the provisions which the township of Salford originally supplied to the officers of the crown, in the reign of the Confessor it contributed to the Exchequer the annual sum of 37*l.* 4*s.*, including the farmed profits of the hundred court, as well as the rents of the demesne lands. The town of Salford with the lands between the Ribble and the Mersey were purchased in the year 1227, from Roger de Maresey by Ranulph de Blundeville, earl of Chester, who in the 13th Henry III. received a confirmation of his purchase, and thereupon granted a charter creating Salford a free borough. In consequence of this grant, the boroughreeve, constables, and burgesses of Salford determined, at a general meeting held on the 16th June, 1830, to adopt and use as a common seal for the borough of Salford, the arms of Ranulph de Blundeville. This charter is substantially the same as the Manchester charter, granted by Thomas de Grelley nearly a century afterwards, the principal difference consisting in a provision 'that every burgess shall have one acre attached to his burgage, paying twelve pence for all rents belonging to that burgage.'

Salford is under the government of a boroughreeve and constables. Antiently the duty of the boroughreeve was to collect the rents and tolls of the land for the lord, as his bailiff, and to be the chief pledge for the preservation of the peace. At present the duties of the boroughreeve are to convene and preside at public meetings, to correspond with public bodies, and to distribute certain charitable bequests. These officers are elected by a jury, summoned by the deputy-steward of the hundred, at the king's Michaelmas Leet of Salford hundred. By an act of parliament obtained in the year 1829, the police of Salford was separated from that of Manchester, and placed under a body of men nominated 'the Commissioners for better cleansing, lighting, watching, and regulating the town of Salford,' under whose control the township still remains. The commissioners are the boroughreeve and constables for the time being, and 120 persons occupiers of one or more tenements assessed at 20*l.* a year clear, or persons rated below that amount but being owners of property producing 30*l.* a year clear, to be elected commissioners by all persons assessed to the relief of the poor. The commissioners nominate the surveyors of highways. In 1820 Messrs. Appleby, Clay, and Fisher erected gas-works in Clowes Street, from which Salford was supplied by contract until December, 1831. The present gas-works are in Lamb Lane, near the centre of the township, and are the property of the lay-payers. They were erected in 1835, under an act of parliament: the profits are appropriated to the improvement of the town, the extension of the works, and the liquidation of the debt. The quantity of gas made in 1838 was twenty-six millions of cubic feet; the price, 8*s.* per 1000 cubic feet. The w [illegible] by a Board of Directors chosen annually [illegible] body of commissioners. The expenditure [illegible] sioners of police, from June, 1839, to June, 1840, [illegible] Within the same time 3810*l.* were expended by the 'Improvement Committee.'

Salford is rich in foundations for the relief of the poor, which materially diminish the poors' rate. Some of these charities would have been more productive, if they had been formerly as well managed as they are at present. In 1840 Salford came under the regulations of the New Poor Law. The following statements rest on the authority of one of the constables:—The average number of paupers for Salford (the township) for the quarter ending December, 1840,

Receiving out-door relief . . .	790
Receiving in-door relief . . .	316

Average relief per head about 1*s.* 0½*d.* a week.

Assessments in Salford for the Poors' Rate, 1840.

	Number.		Assessments.
10*l.* and upwards	3779	Net rental	£104,6[illegible]2 12
Under 10*l.* . .	7827	Do.	47,030 15

The assessment is taken on the gross rental, allowing 5 per cent. for repairs on property above 10*l.*, and 10 per cent. on all under 10*l.*, and this forms the net rental and the assessments as above.

The expenses for the relief of the poor and other charges, except those of county and parish highways, are as follows:—

	£	s.	d.	£	s.	d.
1834-5 . . .	£4,974	11	4			
1834-5 . . .	4,399	17	2			
1835-6 . . .	4,061	1	8			
1836-7 . . .	4,367	5	2			
1837-8, the last year before the Union . .	8,543	14	0			
Total in 5 years .	£26,346	9	4			
Yearly average .	5,269	5	10			
Expenditure from 25th December, 1839, to 25th December, 1840 (being the first year under the Union) . .	6,592	17	9			
				£1,323	11	11
Paid for county and parish highway-rates for the 5 years previous to the Union .	7,520	9	4			
Yearly average . . .	1,504	1	10			
Paid last year . . .	2,094	1	1			
				589	19	3
Making together an annual increase of				£1,913	11	2

Salford Borough.—By the Act 'For amending the representation of England and Wales,' Salford was constituted a parliamentary borough, with the privilege of sending one member to the House of Commons. The borough includes the townships of Salford, in the parish of Manchester, population in 1831, 40,876; of Broughton, in the parish of Manchester, population 1589; of Pendleton, in the adjoining parish of Eccles, population 8435; and Pendlebury, in Eccles also, population 1556: making in the whole a population of 52,456. Since 1831 the population has increased very much, as may be inferred from the increase of the parliamentary constituency. The total number of persons whose names stood at the first election in 1832 on the revised list was 1498; in 1834 the number had risen to 2165; in 1835 to 2335; in 1836 to 2638. In 1839, in consequence of bad times, it had fallen to 2549, which number was diminished in 1840 to 2443, showing an increase of about a thousand voters to the constituency in eight years, three of which were years of great commercial difficulty. The first election was in 1832.

The rise in the value of property in Salford has been very great. In 1704 Thomas Dickinson gave for the use of the poor a house and land in Salford, which then produced 8*l.* 10*s.* a year, but in 1798, 40*l.* a year. In 1630 Humphrey Booth gave lands in Oldfield Lane and Gravel Lane for the repairs of Salford chapel and the surplus for the poor, value 44*l.* annual rent, which in 1798 produced 23[illegible]*l.* 10*s.*, and in 1840 not less than 629*l.* Of the township of Broughton, consisting of 1004 statute acres, 870 are possessed by the Rev. John Clowes, an estate which, in the last five years, has more than doubled its rental, although little more than 200 acres have been sold in the whole.

Manufactures.—The following table shows the extent to hich manufactures are carried in the borough:—

and Water Power in the Borough of Salford, from a Re-ort of the Manchester Statistical Society, June, 1837.

ps.	Steam-Power.													Water-Power.			
	Spinning and Weaving.	Bleaching, Dyeing, and Printing.	Foundry, and Machine making.	Silk.	Colliery.	Thread and Small Wares.	Flax.	Breweries.	Fustian-shearing.	Woollen.	Chemical.	Sundries.	Total Steam Power.	Cotton Manufactures.	Dyeing, Printing, and Bleaching.	Total Water-Power.	Total Steam and Water-Power.
	710	399	228	54	..	36	..	56	34	22	11	46	1596	..	..	..	1596
on	54	48	..	..	100	..	30	6	..	..	..	..	238	80	10	90	328
on	..	136	..	50	..	..	40	..	..	..	..	..	226	..	..	..	226
r	764	583	228	104	100	36	70	62	34	22	11	46	2060	80	10	90	2150

The condition of the working classes was inquired into in e years 1834-5-6, by the Manchester Statistical Society, om whose published Report we take the following details:— Salford the proportion which the population examined re to the total population (estimated at 55,000) was 74 r cent.; 72 per cent. of the houses are reported as comrtable; 8 per cent. of the working population resided in llars—generally two rooms, one for sleeping, the other r all other purposes; 1108 single rooms constituted each dwelling; 9538 dwellings, at an average weekly rent of . 10*d.* give an annual rental of 70,263*l.*; 3335 persons cupied cellars; 5991 children were receiving wages; ,529 children were under 12 years of age; 6888 above; tal 20,417 children: 10,220 children were stated by their rents to be in attendance at a Sunday or a day school; .,853 persons could write or read. The members of the stablished Church amounted to 53 per cent. of the whole. many, perhaps in the majority of cases, there were only o beds to a family of five or six persons of both sexes.

Notwithstanding the pressure in the commercial world hich prevailed from 1836 to 1840, the Committee of the anchester and Salford Bank for Savings reported a very nsiderable increase in the business of the Bank during 40, which however they partly attribute to the adoption of rtain improvements.

			£	s.	d.
The amount deposited in the year ending Nov. 20, 1840, was			116,048	12	8
Amount withdrawn	„	„	92,461	11	0½
Amount remaining due to Depositors .	„	„	366,423	18	1½
Number of Accounts remaining open .	„	„	13,453		
Number of Deposits made		„	23,811*		

Education in Salford has of late years made rapid pro- ess, but is still inadequate to the wants of the population. om the Parochial Returns made to the Select Committee the House of Commons appointed to inquire into the ucation of the poor, Session 1818, it appears that then ere were two 'national schools for 300 boys and as many rls; also three Sunday-schools, two of which are attached the church, of about 400, and one of 200 or 300, concted by Methodists; besides which there are three schools r adults.' The population is reported as 19,114. The eturns add, 'the minister of Salford supposes all may arn to read who desire.' This extraordinary statement is tested by the signature, 'Saml. Booth, minister.' In 35 the Statistical Society of Manchester caused an iniry to be made into the state of education in the borough Salford, when it appeared that in a population of 50,810 ensus 1831) the numbers attending the various schools the borough were 12,885, of whom

3,131 or 5·7 per cent. of the population, attended day and evening schools only.
3,410 or 6·2 „ „ attended both day and Sunday schools.
6,344 or 11·5 „ „ attended Sunday-schools only.

12,885 or 23·4 per cent. of the population.

Of these about 2235 were found to be either under 5 or above 15 years of age, leaving about 10,650 children between the ages of 5 and 15 under instruction; the total number of children between these ages being computed at 13,750, thus leaving 3100 or 22½ per cent. of the whole without any education. Above one-quarter of the number receiving daily instruction were found in the dame-schools, very few of which possessed more than fragments of books; in many cases no books at all were to be seen, the mistress not having the means and the parents being without the ability or the inclination to procure them. Order and cleanliness were little regarded, and the children were for the most part crowded in close and dirty rooms, in which the whole business of the school was carried on, and where the family slept. Some of the teachers followed another occupation, such as shop-keeping, sewing, washing, and the generality of them were wholly incompetent to the task of instruction, and betrayed lamentable ignorance on the most common topics.

Charities and Educational Institutions.—The Salford Mechanics' Institution was founded at a general meeting held in the town-hall, Salford, on Monday, the 28th May 1838. 'The object of the institution is to instruct the operative in the principles of his trade or employment, and in other departments of really useful knowledge, that he may be enabled to understand those fundamental laws which are the key to the various branches of our arts and manufactures; so that whilst he acquires a greater degree of skill in the practice of his business, and consequently becomes more valuable to his employers, he may be better enabled to secure to himself and his family the means of comfort and rational enjoyment.' The principal means for carrying this desirable object into effect are classes, lectures, a library, and reading-room. The Salford Mechanics' Institution follows the general practice of similar establishments in excluding 'party politics and controversial theology,' subjects of the deepest and most pressing interest to the people, by which in reality they have given their minds most of the discipline they have received, and which the people ought to be taught to treat and discuss in a proper spirit.

The subscription to the institution is the payment of sixteen shillings annually in advance. The government is vested in a board of directors, consisting of a president, six vice-presidents, a treasurer, and twenty directors, to be chosen annually by the members out of their own body. Immediately on its establishment the institution began to fulfil the hopes of its friends. The reading-room was furnished with five weekly, ten monthly, and four quarterly periodicals; classes were formed, and began to study in arithmetic, algebra, geometry, grammar, writing, architectural drawing, ornamental drawing, perspective drawing, mechanical drawing, French, and elocution. A society was also formed for 'mutual improvement.' The foundation of a museum was laid. A library was commenced. Several courses of lectures, amounting in all to 50, were delivered. The Report for the year 1840 states the number of members as 310, and that the library contained 1159 volumes and 59 pamphlets, the average number of daily deliveries for the year being 32 volumes, and the total number of deliveries 9524 volumes.

In this year a new means of usefulness was devised, which deserves special notice, and may be advantageously imitated in other parts of the kingdom; namely, an *exhibition* of works of art, manufactures, models of machinery, curiosities, and antiquities, with a view to the general improvement of the people, and to aid the funds of the institution. Among other things, the visitor saw in actual operation the planing-machine, card-making machine, carding, roving, spinning of cotton, glass-engraving, &c., all at work by steam-power. Lectures were delivered on the polarization of light, chemistry, bleaching, and the chromatic fire-cloud. Ninety thousand persons passed through the exhibition.

The Salford Lyceum is one of a class of institutions preeminently fitted to benefit the working and the poorer classes. It was established in January, 1839, and has for its design 'to provide a system of juvenile and adult education for both sexes of the most numerous portion of the community, and to extend more widely the taste and means for moral and intellectual cultivation.' The Salford Lyceum embraces, in addition to the ordinary purposes of mechanics' institutions, the following fundamental objects:—female instruction—evening classes are held for instruction in branches of knowledge most suited for females in the manufacturing district; the newspaper press—a news-room is supplied with journals of all political opinions; useful recreation—there are classes for vocal and instrumental music, concerts and musical meetings, and social and festive parties; cheapness—the subscription is only two shillings a quarter. From the Report for 1840 it appears the number of 2017 subscriptions had been received from the 24th of January, 1839, to the 24th March, 1840, which are classed as follows:—

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* Of these, 9462 did not exceed £1 1s.; and 8656 were from £1 1s. to £5; e entire number of single deposits in 1840 was 23,811.

Merchants, manufacturers, and professional men	48
Bookkeepers, clerks, salesmen, and warehousemen	253
Mechanics, engineers, founders, and mill-hands	838
Engravers, pattern-designers, and calico-printers	285
Joiners, plumbers, carvers and gilders, masons, and painters	179
Butchers, bakers, and brewers . . .	27
Shopkeepers, tailors, drapers, and shoemakers	113
Letter-press printers and bookbinders . .	53
Hairdressers	11
Boys and females undescribed . . .	169
Undescribed males	41
Total . . .	2017

The library consisted of about 1500 volumes; the number of deliveries averaged about 70 each evening, and there were generally above 400 volumes in circulation at one time. The following classes for males were in operation:—Reading, weekly average attendance 50 pupils; arithmetic and writing, 163 pupils; grammar and geography, 40 pupils; elocution, 20 pupils. Classes were also held for females in reading, writing, arithmetic, sewing, and embroidery; classes for vocal and instrumental music met every week. An essay and discussion society, of 30 members, held its meetings each alternate Thursday. The directors, ever aiming at affording rational amusement to the working classes, held several tea-parties, making for admission a small extra charge, which, though sufficiently moderate to occasion the assembling of considerable numbers, was found equal to defray the expenses incurred; the amusements consisted of glees, songs, recitations, musical promenades, accompanied by an instrumental band. During the year, 32 lectures were delivered on various subjects, as astronomy, oratory, comic literature and ballads, geology, natural theology, anatomy; 21 of these lectures were given gratuitously. The directors state that they have full confidence that 'the subscription, under judicious management, will to a very great extent meet the current expenditure, although to do this the union of large numbers is indispensably necessary.' The 'Financial Statement' for 1839-40 shows a small balance in favour of the institution, the total outlay being about 500*l*.

Previous to the year 1827 the working classes of Salford and the suburbs were dependent on the public institutions of Manchester for gratuitous medical relief. The rapidly increasing population rendering it absolutely necessary that some additional assistance should be provided, a public meeting was held on the 2nd of May, 1827, at which the immediate establishment of a public dispensary was resolved upon. A building was taken in a central situation; and on the 10th of September the dispensary was opened for the admission of patients. But the wants of the poor were soon found so pressing as to require a larger building. Measures were accordingly taken, and a new edifice, designated the Salford and Pendleton Royal Dispensary, was completed early in 1831, at an expense of 2546*l*.; and on the 25th of March, 1831, the business of the charity was removed to it. The government of the Institution is vested in a committee. It is supported by the voluntary subscriptions of the inhabitants.

The following table gives the relative number of patients admitted since the opening of the establishment, and the expenditure for each year. The out-patients are those capable of attending at the dispensary; and the home, those whose complaints require them to be visited at their own residence. Accidents constitute a large proportion of the whole number of cases, many of which are caused by the machinery in the numerous mills and manufactories in the vicinity of the Institution:—

Year.	Out-Patients.	Home-Patients.	Accidents.	Total.	Expenditure.
1828	1696	965	318	2979	
1829	..	..	648	3611	£735
1830	..	..	756	3667	£721
1831	2146	1316	803	4265	730
1832	2073	1268	900	4241	749
1833	2212	1210	944	4366	672
1834	1813	1069	926	3808	700
1835	1639	1653	1047	3739	659
1836	1915	1045	987	3947	699
1837	1863	1201	896	3960	678
1838	2113	1280	897	4290	698
1839	2519	1436	870	4825	721

The Public Buildings in Salford are not distinguished for architectural beauty. The oldest place of worship, Trinity chapel, was founded (1635) by Humphrey Booth, a prosperous merchant of Salford, and was rebuilt in 1752. The town-hall, situated in Chapel-street, is a neat building of stone, of modern date, after a design by Mr. Lane. The Salford police-office occupies one portion of the building; other parts are occupied by the officers of the guardians of the poor, the clerks of the police commissioners, [illegible] contains a large room used for public meeti[illegible] lectures, &c. The Zoological Gardens in H[illegible] were opened May 31st, 1838. They occup[illegible] of land, laid out in the best style of landscape [illegible] They have a fine collection of ani[illegible] mended by their locality, as well as [illegible] displayed in laying out the land and en[illegible]

Eminent Individuals.—Dr. Clarke, pro[illegible] geography, and experimental philosoph[illegible] Military College, Sandhurst, was born at [illegible] John Byrom, of the ancient family of Byr[illegible] the borough of Salford, inventor of a s[illegible] and a respectable poet, was born at Ke[illegible] Crabtree [HORROCKS] was born at Bro[illegible] of Salford, in 1610; baptized in the Co[illegible] chester, July 29; educated at Cambridge; [illegible] ber, 1633; and was buried in the Collegiate church, August 1, 1644. By observation made on Kersall Moor, he found that the planet Venus would pass the sun's disk, which phenomenon took place Nov. 24, 1639. The only [illegible] who appear to have any knowledge of it were [illegible] and his friend Horrocks, to whom he had commu[illegible] the fact.

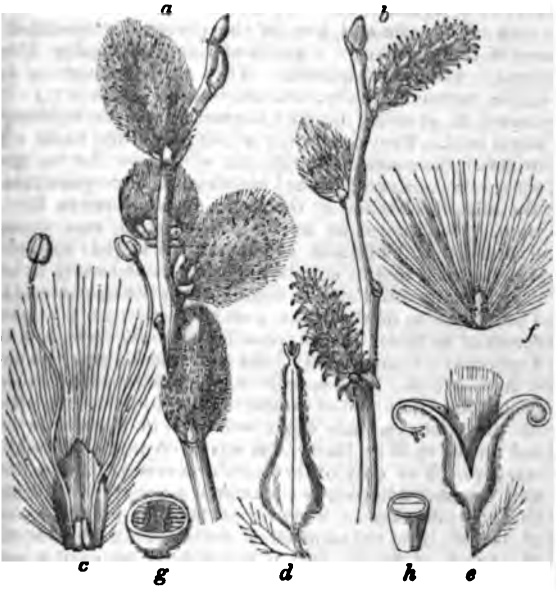
(Communication from Salford. For further informat[illegible] see Baines's *History of Lancashire; Manchester as it [illegible] Annals of Manchester; Reports*, &c.)

SALIAN. [KUR.]

SALIC LAW. [PHILIPPE V.; PHILIPPE VI.]

SALICA'CEÆ, or *Salicinieæ*, a natural order of [illegible] Exogens possessing the following characters:— [illegible] pistils or stamens alone, growing on the [illegible] plants, and arranged in the form of an amen[illegible] separate, or united together with two-celled anthers: [illegible] rior ovary, with one or two cells; numerous [illegible] style single, with two stigmas, or absent; [illegible] mose, 10-12-celled, coriaceous fruit; seeds [illegible] attached to the lower part of the axis of each [illegible] base of the cell; albumen absent; embryo erect; [illegible] ferior. They are trees or shrubs, with simple alter[illegible] and deciduous or persistent stipules. Combined [illegible] laceæ and Betulaceæ, they formed part of the Amentaceæ of Jussieu, but they have been separ[illegible] Richard. They are distinguished from C[illegible]laceæ [illegible] absence of a calyx, and frequently by the [illegible] leaves: from Betulaceæ they are known by [illegible] seeds and polyspermous two-valved fruit. They are found inhabiting woods in the northern districts of [illegible] Asia, and America. The most northern woody pl[illegible] known, the *Salix arctica*, belongs to this order. [illegible] only two genera in this order, Salix and Populus: [illegible] are of great importance on account of their various economical uses.

The genus *Populus* (from the Latin *populus*) is charac[illegible] by possessing diœcious, cylindrical, many-flo[illegible] wedge-shaped, single-flowered, jagged bract[illegible] turbinate calyx, tubular below, and dilated [illegible] The barren flowers have eight or more [illegible] filaments, and large drooping quadra[illegible] fertile flowers have an ovate pointed ovary. [illegible] awl-shaped stigmas; ovate capsule, with two [illegible] and one cell; numerous small ovate seeds, [illegible] with a tuft of fine hairs. All the species of deciduous trees, mostly of a large size, and growing in Europe, North America, Asia, and the north of Africa. The poplar has long been valued as an ornamental tree, and the various species have been extensively cultivated in Europe. As they are diœcious plants, much difficulty has arisen in determining the number of the introduced species; and it is probable that when the plants with male and female flowers shall have been carefully examined, a considerable reduction in the present number of acknowledged species will take place.



Salix caprea.

a, branch with staminiferous flowers; b. ditto, with pistilliferous flowers; staminiferous bract, with abortive pistil; d, pistilliferous bract, with closed posed pistil; e, ditto, with valves open; f, seed with hair; g, section of fruit, howing seeds; h, section of seeds, showing cotyledons.

Populus alba, the white poplar, or Abele tree, has roundish, ordate, lobed, and toothed leaves, glabrous above, downy nd very white beneath; fertile catkins, ovate; four stigmas; reeping roots; branches very white, downy when young. his tree is a native of Great Britain and most parts of urope, in woods and thickets in a moist soil.

Populus canescens, the grey poplar, is by some writers idered only a variety of *P. alba*. It is known by its es being roundish, deeply waved, toothed, downy, and y beneath; fertile catkins cylindrical; stigmas eight. his tree is of slower growth than *P. alba*, and the wood is r, and more adapted for the purposes to which timber plied. Not fewer than eight distinct varieties are enuted as cultivated in our nurseries, and probably many might be added to the list by a careful examination of ons of these plants. The white and grey poplar both a height from 80 to 100 feet. All their varieties exceedingly fast, sometimes attaining a height of 30 in ten years. They are remarkable for the creeping of their roots, which send up suckers for a great ce round the trunk, and by these a perpetual sucn of young trees may be kept up. The trees will ure for two centuries if allowed to remain; but if wanted timber, they should be cut down before they are fifty s old, as after that period the heart-wood is liable to y. The Abele, as well as the black poplar, was known the Romans, and was recommended by Pliny as props the vine. (*Hist. Nat.*, xvi. 23.) It is much planted in parts of Holland, Flånders, France, and Germany. principal use to which the Abele is put in England is of making flooring boards, for which purpose it should soned eighteen or twenty months previous to use. It employed by the cooper for making wooden dishes, ks, &c. The grey poplar possesses the whitest wood of of the species, and is used in France and Germany for ving and the lighter kinds of architecture.

These poplars should be planted in a loamy soil near water, it be desired that they should attain a great height or iderable size. They will however grow very well on dry soils. In the nurseries near London they are usually pagated by layers, which ought to be transplanted into nursery lines for at least a year before removal, as they seldom ripen the points of their shoots or put forth many roots the first season. The Abele bears cutting or lopping worse than any other species of the genus.

Populus tremula, the trembling poplar, or aspen: leaves nearly orbicular, broadly toothed, glabrous on both sides; stalks compressed; stigmas four, erect, cased at the base. Ten or twelve varieties of this plant are found in the nurseries, and some writers refer several other species to this as varieties. The aspen, like all the genus, is a rapid-growing tree. It has horizontal branches, which become pendulous by age. It is a native of moist woods in Great Britain, and in Scotland is found at an elevation of 1500 feet above the level of the sea. It is also found in the whole of the south of Europe, in the Caucasus, in Lapland, and is very abundant in Russia. The wood of this tree is used for much the same purposes as the last. Sheep and goats are said to be very fond of the leaves and bark. In common with *P. alba* and *P. nigra*, the bark of this species is used in tanning. It has even a greater tendency to send up suckers than the other species, and on this account requires attention, as it would otherwise cover the whole district in which it is planted. In cultivation this tree ought to have a rich and loamy soil, but it does not require a soil of any great depth. It may be propagated by cuttings or by seeds.

The trembling leaves of the aspen have always excited attention, and have frequently been the subject of superstitious belief and poetical allusion. Among other superstitions of former times, this tree was believed to have supplied the wood of which the cross of Christ was made, and its trembling leaves were thought to bear testimony to the fact.

Populus trepida, the American aspen, is by some looked upon as a variety of *P. tremula;* the leaf is suborbiculate, with an abruptly acuminate point, toothed, with two glands at the base on its upper surface; silky whilst young, glabrous afterwards. It is found in North America in extensive swamps from Canada to the Carolinas, and from Hudson's Bay to the northward of the Great Slave Lake as far as lat. 64°. It attains a height of from 20 to 30 feet. *P. grandidentata*, the large American aspen, is nearly allied to the above, and is probably only a variety of *P. tremula*. It attains a height of 40 or 50 feet, and is found in the same situations, but much less frequently than the foregoing. *P. græca*, the Grecian poplar, seems also to be a variety of the aspen.

Populus nigra, the black poplar: leaves twice the length of their footstalks, deltoid or unequally quadrangular, serrated, with glandular teeth, glabrous; the base more entire, the under side palest; catkins cylindrical, pale, lax. It is a native of Great Britain, and has a geographical range nearly the same as that of *P. alba*. It attains a height of from 70 to 80 feet, and, on account of its rapid growth, has been much cultivated. The wood is used for the same purpose as that of *P. tremula;* it is however softer, and more easy to work, and splits more easily than any other of the species. The cotton from the seeds has been used in France and Germany as wadding, and has been also manufactured into cloth-hats and paper; but the expense of cultivating the tree for this purpose was too great, and consequently the manufacture has been given up. It is best cultivated in a good soil near water. It may be propagated by cuttings or truncheons. It is subject to the attacks of an aphis, the *A. populi*, which penetrates the tissue of the leaf and petiole, and produces little protuberances of various shapes and sizes, similar to those produced in the leaves of the oak by the cynips.

Populus canadensis, the Canadian poplar, is an American species: it has angular branches, a compressed petiole; leaves roundish ovate, deltoid, acuminate, subcordate at the base, where there are glands serrated with unequal teeth, glabrous. It attains a height of 70 or 80 feet, and is found wild in the rocky districts of North America between Canada and Virginia. In America it is considered the best of all poplars for planting. The young shoots are used as food for horses. The poplar avenues in the garden at Versailles are formed of this tree.

Populus monilifera, the black Italian poplar: shoots more or less angular; branches round; petiole slender, compressed in the upper part; disk deltoid, glands at the base, subacute, serrate, glabrous; bracteæ glabrous; stamens 16; stigmas 4. It is doubtful of what country this tree is a native. It appears to have been introduced into England by Messrs. Dickson, nurserymen, from North America. In America however it is called Italian poplar, and in France *Peuplier Suisse*. It is probably a variety of an European species that has been introduced into America. It is the most rapid-growing of all the poplars, and in this country the timber is considered equal if not superior to that of any other species. In the neighbourhood of London, it has been known to grow 30 or 40 feet in height in seven years. In America it attains a height of only about 70 or 80 feet, but in England it reaches 100 or 120 feet and upwards. There are two varieties cultivated in the Horticultural Society's garden, London, *P. m. Lindleyana*, with wavy leaves, and *P. m. foliis variegatis*, with variegated leaves. In the middle of May it sheds its seeds, which are covered with a cottony down, and when lying on the ground look like snow. These seeds adhere to everything in their vicinity, and become in consequence a great nuisance when planted near houses. For this reason, male plants alone should be planted near habitations. It requires a fertile soil near water, and grows very freely from cuttings.

Populus fastigiata, the Lombardy poplar: leaf deltoid, wider than long, crenulated, glabrous, in the bud involutely folded, petiole compressed. This tree is readily distinguished among the species by its peculiar conical cypress-like form, and the total absence of horizontal branches. It grows to the height of 100 and 120 feet, and sometimes 150 feet. It is a native of Italy on the banks of the Po, and also of Persia and the Himalaya. It was introduced from Italy into Britain about the year 1758, and is now very generally diffused, some parts of the country exhibiting magnificent specimens. The wood of the Lombardy is inferior to that of the black poplar and the black Italian poplar. It is used for making packing-cases, rafters, small beams, studs, boards, &c. But the great use of the tree in this country is in ornamental planting, and for this purpose its spiry straight form adapts it exceedingly well as a contrast to the round-headed trees that are so numerous. It is well adapted for growing in villages, towns, and near houses, as the branches, not being horizontal like most other trees, will not interfere with the walls nor obstruct the entrance of light through windows. In ornamental planting, it may be placed near bridges, viaducts, rows of houses, and long buildings, as the perpendicular lines formed by the tree relieve the horizontal lines of the building. It requires a good soil, but will not even then grow well unless near water.

Populus balsamifera, balsam-bearing poplar, or Tacamahac tree: leaves ovate-oblong, quite smooth, with fine glandular serratures, deep green above, almost white but smooth underneath. Sometimes 2 glands at the apex of the petiole. Buds covered, in the spring, with an abundance of fragrant, viscid, balsamic juice. It is a native of North America, Da-uria, and the Altai, and attains a height of 80 feet. It is remarkable for its balsamic secretion, which was formerly collected in Canada in shells, and, under the name of *baume focot*, was sent in considerable quantities to various parts of North America. In Siberia a tincture is prepared from the buds, which is said to be antiscorbutic. But in Europe the principal use of the Tacamahac and its varieties, of which there are several from various districts, is in ornamental planting, for which it may be used instead of the Lombardy poplar.

P. betulifolia, *heterophylla*, *angulata*, and *candicans*, American species, have also been cultivated in this country, and deserve a place in all collections of these plants.

SALICIN, a neutral principle obtained from several species of salix: it is white, crystallizes in scales, inodorous, very bitter, fusible below 212°, and does not lose water at 392°. It is much more soluble in hot water than in cold; it is dissolved by alcohol, but is insoluble in æther and volatile oils.

According to Piria, anhydrous salicin is composed of—

Hydrogen . .	5·79	or 24	equivalents.
Carbon . . .	60·25	„ 42	„
Oxygen . . .	33·96	„ 9	„
	100·		

In its crystalline state it contains two equivalents of water. When treated with very dilute and hot hydrochloric or sulphuric acid, a resinous substance is formed, to which Piria has given the name of *salicetin*: it rises to the surface of the liquid as it forms, and is of a white or yellowish colour: it differs in properties and composition from salicin.

By the action of oxidizing agents salicin is converted into *salicyle*, which has not been obtained in a separate state, but is capable of combining, like a simple substance, with different bodies. When hydrate of salicyle is heated with potash, an acid is formed, which is separable from the alkali by means of stronger acids, and being but slightly soluble in water, it is precipitated in crystals resembling benzoic acid in appearance. Salicin possesses tonic properties analogous to those of disulphate of quina, and it is stated to be less liable to irritate the stomach.

SALICI'NIÆ. [SALICACEÆ.]

SALICOQUES. [SHRIMPS.]

SALICO'RNIA (from *sal*, salt, and *cornu*, a horn, in reference to the taste and form of the plant), the systematic name of the Glassworts, a genus of plants belonging to the natural order Chenopodiaceæ. They are characterised by a single, turbinate, fleshy, obscurely-lobed perianth; 10-12 stamens; short style; bi-trifid stigmas; fruit a utricle with a single seed. They are mostly weeds inhabiting moist salt districts on the coasts of the North of Europe, Africa, and America. *S. herbacea*, jointed glasswort, is a common plant in the salt marshes and on the banks of salt rivers in Great Britain. It is known by its herbaceous stem, compressed and notched articulations somewhat thickened upwards, and cylindrical spikes slightly tapering at the extremities. This, and many other species belonging to the genus, and to the other genera of the same natural family, yield a great quantity of soda, for the purpose of obtaining which they are collected on the coasts of the South of Europe and the North of Africa. This species is often eaten as a salad or pickle under the name of samphire, but is a different plant from the true samphire (*Crithmum maritimum*), which is found on the cliffs at Dover, and has been immortalised by Shakspere. The only other British species is *S. radicans*, which by some botanists is considered a variety of the last with a creeping stem. *S. fruticosa*, shrubby jointed glasswort, is a doubtful native of Great Britain, but grows largely in the South of Europe and in North America, and is used for the same purposes as the above. The species of this genus are rather numerous, but most of them possess properties in common with the foregoing.

Some of the species are very common on the Coromandel coast, whence Dr. Roxburgh, in his 'Flora Indica,' recommends the manufacture of alkali, which, from the cheapness of labour, he conceives might be made there at so low a rate as to admit of its being profitably sent to Europe. [SALSOLA.]

SALIENT, a term applied to an angle which presents its point to the outside of the figure, as opposed to re-entering or re-entrant, which is applied to an angle presenting its point to the inside of the figure. These terms are frequently used in fortification, and seldom in geometry.

SALIE'RI, ANTONIO, a composer of great eminence in his day, was born at Legnano, in the Venetian territory, in 1750. When only fifteen years of age he lost his father, a respectable merchant, and then immediately determined to make music, which he had studied only as an accomplishment, his profession. His first master was Giovanni Pescetti, and his next Leopold Gasmann. The latter took his pupil to Vienna, where he made the acquaintance of Gluck, who, at that time declining in health, entrusted Salieri with the charge of composing *Les Danaïdes*, which the great German master had engaged to produce for the *Académie Royale de Musique*. It was performed with the most brilliant success in Paris, and not only made the reputation of the author, but added nearly 20,000 francs to his fortune. He afterwards brought out, at different theatres, many operas, among which his *Tarare*, or *Axur Roi d'Ormus*, and *La Grotta di Trofonio*, were the most popular, and are now best known. He died at Vienna, in 1823. Salieri was a kind of rival of Mozart, and, strange to relate, his music was much preferred by the court and fashionable circles of Vienna to that of the greatest dramatic composer that then or has ever since lived.

SALIES. [PYRENEES, BASSES.]

SALIFEROUS SYSTEM. In geology, the series of calcareous, argillaceous, and sandy strata, locally and frequently productive of rock salt or brine springs, and of gypsum, is thus designated. The equivalent terms are, New Red System, from the prevalence of a particular colour in the sandstones and clays; and Poicilitic System, from the various colours of the rocks. The term saliferous is formed on the same model as carboniferous, oolitic, &c., salt being the characteristic portion of its component masses. Salt is abundantly but not exclusively found in this system of deposits. Springs more or less salt are indeed met with in a great proportion of the whole series of strata; in England they are rather prevalent in rocks of the carboniferous system (as at Harrogate, Ashby de la Zouch, and near Newcastle), but we have no knowledge of real beds of salt except in the midst of red marls and sandstones. On the continent of Europe this is not the case, for though salt occurs in the Poicilitic marls and beds associated therewith (especially the Muschelkalk) in Germany and France abundantly, it is also found in the tertiaries of Poland, the greensand series of Spain, and the oolitic system of the Salzburg Alps.

Viewed on the great scale, the Saliferous System of rocks is one of the most varied and interesting we are acquainted with. There are peculiarities in its limestones, sandstones, and clays, as well as in its gypseous and salt deposits; the occurrence and nature of its organic contents, and the relation which it bears altogether to earlier and later classes of rocks, are worthy of careful study. Some of the peculiarities of its limestones have been noticed under the head of Magnesian Limestone, and for the changing qualities of its sandstones and clays see Red Sandstone and Red Marl. We shall here add a few reflections on the salt and gypseous masses, and on the organic contents of the Saliferous System.

Sulphate of lime is found perhaps as frequently and under almost as many curious circumstances in the stratified rocks, as carbonate of lime, in mealy aggregations, acicular prisms, broadly foliated crystals (selenite), fibrous masses and beds, and marmoroid or alabastrine rocks. It lies in strata of almost every age, and is not absent from diluvial, alluvial, and recent deposits. The mode of its occurrence is in a considerable degree characteristic of each particular mineral type. While long prismatic crystals appear in cavities of shells and in recent excavations (as in the gallery of Felling Colliery, Newcastle), the solitary broad flaky crystals of selenite abound in blue clays of the tertiary and secondary series (which receive their colour from protoxide of iron), and the fibrous gypsum marks, spots, and irregular lines in the red clays (coloured by peroxide) of the Saliferous System, the fibres being (in agreement with a general law of structures) arranged so as to lie at right angles to the broader surfaces which bound the mass. The marmoroid texture is most commonly found in real however irregular beds, as at Montmartre, and in some points near Fairburn in Yorkshire, on the line of the York and North Midland railway. At these places fibrous, marmoroid, and flaky sulphate of lime may be obtained in association.

From what is known to take place at the present day, and from appearances in the distribution of the gypsum and selenite in masses of clay and cavities of shells, &c., it appears that in a great proportion of cases these crystallized masses owe their origin to the processes of segregation since the deposition of the earthy masses in which they appear. In no other way is it at all conceivable or even possible that the irregular masses of gypsum which appear in red marl at Axmouth, Aust Passage, and the Trent's mouth could be formed. The marls in which they here lie were deposited as fine mud, and if we suppose merely a slow extrication of the liquid, so that its contained salts might remain, the arrangement of these salts in such irregular masses during crystallization presents no particular difficulty.

Salt shows itself in the Cheshire mines as either granular, broadly laminated, or fibrous; in great beds or minutely mixed with marls, nearly as gypsum is, and probably in regard to its origin, similar suppositions will apply, the solid beds (of limited extent however and irregular area) being due to a great evaporation of liquid over the previously deposited marls. That such water, in the case of rock-salt generally, was derived from the sea, is almost certain, from the occurrence of iodine and bromine in the brine-springs connected with them. (Daubeny's Memoir, in *Phil. Trans.*) But it does not follow that the area in which the salt was found was, at the time of its formation, or for some time previously or subsequently, connected with the sea. Lagoons may have been the theatre of the evaporation supposed, and earthy sediments, such as occur in Cheshire and Poland, may have been drifted in by fresh-waters or the sea, according to circumstances, and it is not difficult to imagine a repetition of the processes such as might produce the two great beds of rock-salt in Cheshire. It is not known that organic remains of any kind accompany the salt of Cheshire, but this is almost true of the whole range of the red marls, in which these deposits lie.

We find, then, associated together, abundance of red oxide of iron, salt, and gypsum, but no organic remains. The prevalence of red oxide of iron in any of the strata is accompanied by a paucity or total absence of organic remains. In the Saliferous System these red strata extend through several hundred feet of thickness, and it is found, in general terms, that the types of organic life above and below are widely different. Similarly the thick series of old red-sandstone contains few organic fossils, and separates two distinct groups of these productions. Some great physical changes then must be supposed to have occurred previous to and during the saliferous period, and to have influenced both chemical and vital phenomena.

M. Adolphe Brongniart (*Prodrome d'une Histoire des Végétaux Fossiles*, 1829), viewing the series of fossil plants, gives four great periods of antient vegetation:—the first extending from the earliest strata to the red-sandstone (saliferous) strata; the second including these strata; the third including the oolites and chalk; the fourth, the tertiary strata. Of these the flora of the second period (chiefly terrestrial) is very limited, and may be looked upon as a transition group of plants connecting the earlier and later periods. Similarly the series of marine invertebrata which lie in the Saliferous system have characters intermediate between the early (palæozoic) and later races of preadamitic life. We find the same results by considering the vertebrated animals; but on a careful scrutiny, this 'transition' character of life is resolvable into two parts; we discover in the Saliferous period *two periods*, marked in geology by the *two formations* in which the Saliferous strata are ranked.

The lower of these, the Magnesian Limestone formation, contains corals, brachiopoda, and fishes, so extremely similar in detail or analogous in their general history to the corresponding forms of the mountain-limestone, that it is impossible in any fair classification to sever this group of fossils from the Palæozoic series; while, on the other hand, the upper of the two formations, the Red-Sandstone and Keuper series, presents almost no resemblance to the older, but a decided analogy to the newer, or, as we wish to call it, Mesozoic series of the Oolites. And this is confirmed by a similar review of the nature and distribution of the fossil plants. In the Upper Red-Sandstone and Keuper we have Pterophylla and Cycadeous plants allied to those of the Oolites; in the Lower Red-Sandstones (Rothliegende), Calamites and Lepidodendra of the coal series.

It appears then that the rocks of this great and varied Saliferous System may be best placed in relation to the other systems of strata by help of a further analysis, as in the scheme subjoined, in which we have added all the other groups of strata to illustrate our general view:—

Proposed titles depending on the series of organic affinities.		Ordinary titles.
Cainozoic strata	upper	Pleiocene Tertiaries.
	middle	Meiocene Tertiaries.
	lower	Eocene Tertiaries.
Mesozoic strata	upper	Cretaceous System.
	middle	Oolitic System.
	lower	New Red Formation.
Palæozoic strata	upper	Magn. Limestone Formation. Carboniferous System.
	middle	Eifel and South Devon.
	lower	Transition strata. Primary strata.

The determination of two of the types of the Palæozoic strata is yet imperfect, because the series of forms intermediate between the transition and carboniferous periods is not fully investigated. It is probable that the Eifel and South Devon fossils make the middle Palæozoic type.

SALIH-BEN BAHLEH (called by Abulfaraj, *Hist. Dynast.*, p. 154, Salih Ben *Nahleh*), an eminent Indian physician, who came to Irak and practised at Bagdad in the time of Haroún al Rashíd, who reigned from A.H. 170 to 193 (A.D. 786 to 808). 'He was distinguished,' says Ibn Abi Osaibiah, Oioún Al-Amba fi Tabacát Al-Atebba (*Fontes Relationum de Classibus Medicorum*, cap. xii., sec. 7),* 'amongst the learned men of India, well skilled in their methods of medical treatment, and had power and influence in the promotion of science.' He acquired great reputation by discovering that Ibrahim Ben Salih, the cousin of the khalif, whom Jabril Ben Bachtishua had pronounced to be dead, was only apparently so,* of which event the same author gives a curious and circumstantial account. It appears that he first went alone into the room where Ibrahim lay, and immediately there was 'heard a sound as of one striking the body with the palm of the hand.' Then the khalif and some others were admitted, and in order to prove that Ibrahim was alive, 'Salih took out a needle that he had with him, and thrust it in between the nail and the flesh of the thumb of his left hand, when he immediately plucked away his hand and drew it towards his body.' He then ordered that his burial clothes should be taken off him, and that he should be washed till the scent of the hanút† was removed; after which he called for some *kundus*, and blew some of it up his nose. In about ten minutes his body began to move; then he sneezed, and sat up in his bed, supposing that he had been asleep, and complaining only that he had been bitten by a dog in the thumb, and that he still felt the pain, at the same time showing the thumb into which Salih had thrust the needle. Ibrahim lived a long time after this circumstance, and married the Princess Alabbasah, daughter of Almahadi, and obtained the government of Egypt and Palestine, and died in Egypt.

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* See an extract from this work (chap. xii.), translated by the Rev. W. Cureton, with remarks by Professor H. H. Wilson, in the 'Asiatic Journal.'

With respect to the kundus, we are told in the 'Kamus' that 'it is the root of a plant which is yellow inside and black out. It operates as an emetic and a purging medicine, and clears away the ringworm. When it is reduced to powder and blown up the nose, it causes sneezing and enlightens the weary eyes, and stops blindness.' See Avicenna (*Canon*, lib. ii., tract 2, cap. 137, p. 280, ed. Venet. 1564), where a description of its medical properties is given. Sprengel (*Comment. in Dioscor. de Mater. Med.*, lib. ii., cap. 192) supposes it to be the same as the Greek *στρόυθιον*, on which there is a chapter in Dioscorides (*loco cit.*), and which he identifies with the 'Saponaria officinalis,' or soapwort.

SA'LII were twelve priests of Mars Gradivus, who formed an ecclesiastical collegium or corporation at Rome. They were chosen from the patricians, and established by Numa to take care of the twelve ancilia, or sacred shields of Mars. The original ancile was said to have been found in the palace of Numa, and was supposed to have fallen from heaven. To secure its preservation, Numa commanded the armourer Mamurius Veturius to make eleven other shields exactly like it; and the twelve were deposited in the temple of Mars on the Palatine hill, and committed to the care of the Salii. (Liv., i. 20; Dionys., ii. 70, 71; Cic., *Rep.*, ii. 14; Ovid, *Fast.*, iii. 387; Festus, s. v. *Mam. Vet.*)

On the calends of March, and on several successive days, the feast of Mars was celebrated by the Salii, on which occasion they carried the shields through the city dressed in their official garments, which consisted of an embroidered tunic with a brazen belt, the trabea, and the apex, or conical cap, with a sword by their side, and a spear or staff in their right hand. They at the same time performed a dance, and sung hymns or songs called Axamenta (Festus, *s. v.*) in honour of Mamurius Veturius, and all the celestial deities; with the exception of Venus. (Macrob., *Sat.*, i. 12; Virg., *Æn.*, viii. 286; Varro, *De Ling. Lat.*, vii. 26, ed. Müller.) These songs were in later times scarcely understood even by the priests themselves. (Quint., i. 6, p. 54, Bipont.; Hor., *Ep.*, ii. 1, 86.) At this festival the Salii were accustomed to partake of an entertainment in the temple of Mars, which was proverbial for its magnificence and excellence. (Suet., *Claud.*, 33; Cic. *ad. Att.*, v. 9; Hor., *Carm.*, i. 37.) There was a magister at the head of the collegium.

Another corporation of Salii, also consisting of twelve members chosen from the patricians, was established by Tullus Hostilius in fulfilment of a vow which he made in a war with the Sabines. These Salii were also called Collini or Agonenses, to distinguish them from the Salii established by Numa, who were surnamed Palatini. (Dionys., ii. 70; iii. 32; Varro, *De Ling. Lat.*, vi. 14; Göttling, *Geschichte der Römischen Staatsverfassung*, p. 192; Ambrosch, *Studien und Andeutungen im Gebiet des altrömischen Bodens*, p. 143, &c.; *Dictionary of Greek and Roman Antiquities*, article *Ancile.*)

SALI'NAS, FRANCISCUS, a profoundly learned musical theorist, was born in 1613, at Burgos, the capital of Old Castile, of which city his father was quæstor or treasurer. Blind from his birth, he had recourse to the study of music, an art to which his deprivation naturally led him. In this his progress was, as is usual in such cases, rapid, and he became a superior organist. While yet a boy he was instructed in Latin by a young woman famous for her knowledge of that language, his success in which led to his being entered at the university of Salamanca, where he applied most assiduously to the Greek language, as well as to philosophy, and then commenced reading the Greek authors on the science of music, with whose writings he made himself thoroughly acquainted, commenting on them in an equally learned and ingenious manner, and correcting errors not before detected, but seen and admitted on his pointing them out in his great work, 'De Musica,' &c., a treatise in seven books, published at Salamanca in 1677. The first book of this is on musical ratios; the second, on musical intervals; the third is a clear description of the various antient *genera;* and the fourth is on the diapason and octave, and on the doctrines of Pythagoras, Aristoxenus, Ptolemy, &c. The remaining three books chiefly relate to rhythm and the feet of the Greek and Roman versification.

Salinas died, according to Thuanus, in 1590. He was highly esteemed by pope Paul IV., who created him abbot of St. Pancratio, in the kingdom of Naples. A full and clear analysis of his work is given by Sir John Hawkins (*History of Music*, iii. 123); to which Dr. Burney has made some interesting additions in the third volume (page 290) of his History.

SALINS. [Jura, Department.]

SALISBURY, or NEW SARUM, a city in Wiltshire, locally in the hundred of Underditch, but having separate jurisdiction, 85 miles from the General Post-office, London, by railroad to Basingstoke, and from thence by Overton and Andover.

This city had its origin in the thirteenth century. The bishop and canons of the cathedral, which was then within the fortifications of Old Sarum [Sarum], being exposed to injury from the captains of that fortress, with whom they were at feud, determined to remove their church to another site; and Herbert Pauper or Poore, who held the see, having obtained an indulgence from the pope, determined on commencing a new church on the lands belonging to the see on the site of the present cathedral (A.D. 1220). The inhabitants of Old Sarum being attached to their bishops and clergy, determined on removing also, and thus the city of New Sarum or Salisbury rose into existence. A charter granted by Henry III., making it 'a free city,' and giving to the inhabitants a fair and a market, contributed to its prosperity, and in the succeeding reigns several parliaments were held here. It was fortified by a wall and ditch; and the erection of a bridge over the Avon at Harnham brought the great western road (which had previously passed through Old Sarum) through this town. Salisbury was the place of rendezvous for Richard III.'s army on occasion of the duke of Buckingham's rebellion; and that nobleman was brought here and beheaded in the market-place, A.D. 1483. During the protectorate of Cromwell (A.D. 1655), Salisbury was occupied by a band of 200 royalist insurgents under Sir Joseph Wagstaffe, who had come over from the Continent, Penruddock, Grove, Jones, and other gentlemen of Wiltshire, who seized the sheriff and judges then holding the assizes, and proclaimed Charles II. king. The rising was speedily put down; and the leaders, except Wagstaffe, who escaped, were executed.

The city, before the late alteration in its boundaries, occupied part of a peninsula formed by the river Avon on the west and south, and by the river Bourne on the east. The village of Fisherton Anger, now included in the municipal and parliamentary limits, is on the west side of the Avon, at the junction with that river of the united stream of the Wily and the Nadder, which meet at Bemerton, two miles west of their junction with the Avon. The principal part of the city lies immediately to the north of the extensive cathedral close, and comprehends the three parishes of St. Edmund, St. Thomas, and St. Martin: it consists of several streets regularly laid out at right angles to each other. Most of the houses are of brick, of comparatively modern erection, and several of them of handsome appearance. The paving and lighting of the town have been much improved of late years; and the principal streets have a stream of water from the rivers conducted through them by canals lined with brick. Fisherton Anger is on the road to Bath. South of the Avon is the suburban village

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* For similar instances, see the note on Rhazes, p. 445.

† 'Hanút is the name of every kind of scent that is mixed for dead bodies.' Kamus.)

nham on the Dorchester and Exeter road. The area
pulation of Salisbury, in 1831, were as follows:—

		Inhab. Houses.	Building.	Uninhab.	Total.	Families.	Persons.
of St. Edmund	Acres 480.	907	1	44	952	1078	4612
St. Martin		457	5	21	483	566	2362
St. Thomas		421	0	18	439	501	2364
ral Close .		86	0	6	92	119	538
City of Salisbury		1871	6	89	1966	2264	9876
on parish (part of) conjectured					290		1396
tything (ditto) ditto					80		400
ty as determined by Boundary Act					2336		11,672

cathedral is considered one of the most beautiful in
id. The close is entered by several antient gates.
edom of the cathedral from the encumbrance of con-
buildings adds much to the imposing beauty of its
nce. The church consists of a nave and choir with
le aisles, a space on the east of the choir, and a
hapel at the east end; a large transept with an
its east side; a smaller transept east of the former,
aisle on its east side; a central tower and spire;
porch, a muniment-room or vestry at the south end
eastern transept; cloisters, and a chapter-house.
ncipal dimensions are as follows:—Extreme length
church without, 474 feet; within, 450 feet, thus
: nave, from the western door to the organ-screen,
et; choir and adjacent space from thence to the
hapel, 151·5 feet; Lady-chapel, 69·5 feet: width
front, 112 feet; breadth of nave and choir, 34
r, with the aisles, 78 feet; great transept, length
t, 230 feet, within, 206 feet; width, with aisle, 57
maller transept, length within, 145 feet; breadth,
sle, 44 feet: Lady-chapel, width, 37·25 feet: height
of the vaulting of the nave, choir, and transepts, 81
f the aisles and Lady-chapel, 40 feet; height without
op of the side aisles, 44 feet; to the parapet of the
, 87 feet; to the ridge of the roof, 115 feet; to the
of the tower, 207 feet; to the summit of the spire,
t. The cloisters form a square of 181·75 feet within
lls, and have a width of 18 feet between the side
nd windows; the height of the vaulting is 18 feet.
apter-house is an octagon of 58 feet diameter inter-
and 52 feet in height to the vaulting. (Britton's
ry *Cathedral*.)
s edifice has the advantage of being built in one
he Early English, and from a uniform and well ar-
plan. The tower and spire are of later date, but
oly accommodated to the style of the building. . . .
alterations have taken away the altar-screen and
the Lady-chapel open to the choir; the organ-screen
modern. In various parts of the church are several
monuments, some of which are very fine. On the
this cathedral presents an object for study hardly
d by any in the kingdom; the purity of its style, and
ious modes of adapting that style to the purposes re-
deserve the most attentive consideration.' (Rick-
The eastern end of the cathedral is of remarkable
; but the west front is less pleasing, from its formal
outline. The spire is remarkable not only for its ele-
but for the curious and ingenious contrivance of its
framework, and for the skill and boldness with which
raised on a tower not designed originally to support
burden. The episcopal palace is a large building of
dates and styles, with an extensive and tastefully
garden. There is in the cathedral close a college or
use for ten clergymen's widows. The close is under
l jurisdiction of the bishop, recorder, and canons re-
ry, who are justices. The three parish churches of
city are large; St. Edmund's and St. Thomas's are
ldings of perpendicular date.
ther public buildings are the council-house, erected
, and devoted to the use of the corporation and the
s of the county; the spacious county gaol and bride-
ected A.D. 1818; the infirmary, a plain and commo-
uilding; the Salisbury and Wiltshire library and news-
ith a small museum annexed to it; a small theatre;
eral dissenting meeting-houses and almshouses.
woollen manufacture, once extensively carried on
as now much declined; the manufacture of fine cutlery has also declined; but the silk manufacture has been introduced with some success; it employed, when the Municipal Corporation Commissioners made their report, 120 persons. There are markets, on Tuesday for corn, and every fortnight for cattle, and on Saturday for cheese and provisions: there are four yearly fairs, but they are falling into disuse.

Salisbury returned members to parliament from 23rd Edward I. The boundaries of the city were considerably enlarged by the Boundary Act, and the suffrage, previously much restricted, extended by the Parliamentary Reform Act. The number of electors on the register in 1834-5 was 650; in 1835-6, 689. By the Municipal Reform Act, the extended parliamentary boundaries were adopted for municipal purposes; the city divided into three wards. The corporate body consists of six aldermen and eighteen councillors, having a commission of the peace. The summer assizes and the Easter sessions for the county are held here, also the city sessions and a court leet and court of record belonging to the bishop. Salisbury is the place of election and a polling-station for the southern division of Wiltshire.

There were, in 1833, in the four parishes just enumerated, two infant-schools, with 164 children, partly supported by subscription or endowment; a classical grammar-school, founded by Queen Elizabeth for 8 boys; four other endowed day-schools, with 10 boys and 28 girls, with the choristers of the cathedral; two 'national' schools, with 210 boys and 150 girls; seventeen private boarding or day schools, with a number of children not ascertained; and nine Sunday-schools, with about 1400 children.

SALISBU'RIA, a genus of the natural family of Taxaceæ, named in honor of R. A. Salisbury, a modern botanist o. distinction. The tree, which is the only one of the genus, has long been known by the Japanese name Gingko. The genus is characterised by having monœcious flowers. The male flowers disposed in a filiform naked catkin, without calyx or corol; stamens numerous; the anthers composed of two cells, which are pendulous and united only at the apex. Female flowers are solitary and terminal. Calyx 4-fid, or rather, a cup-shaped disk, from the thickened apex of the peduncle, surrounds the base of the solitary ovule. Fruit forming a drupe, which has its base supported by a fleshy cup, with a juicy white pulp. Seed nut-like, with an osseous shell, kernel white. Embryo axillary, dicotyledonous, radicle above.

The Gingko grows naturally in Japan, is much cultivated in China, and is found in many gardens in Europe; fine old specimens may be seen at Kew and in the Apothecaries' Garden at Chelsea. In congenial climates it attains the size of the walnut. It is remarkable for the form of its leaves, which are wedge- or fan- shaped, deeply cut in the centre or bilobed, and finely striated with veins, having some resemblance to the leaves of some species of Adiantum, whence it is commonly called Maiden-hair Tree in this country. The pulp of the fruit is austere-tasted, but the kernel is sweet, with some degree of bitterness when raw, but agreeable as a dessert when roasted like chesnuts. They are much eaten in China. Dr. Abel says he saw the fruit exposed in the markets in China, but could not find out to what purpose it was applied.

The Salisburia is best planted on a deep sandy loam, with a dry subsoil, as it will not grow with a wet bottom. The situation should be sheltered, but it may be more exposed than many exotic plants. It is frequently planted against a wall in order to afford protection, but this does not appear to be necessary in the south of England. Salisburia can be grafted with much facility, and thus male and female flowers may be easily produced on the same tree.

SALI'VA, SALIVARY GLANDS. The principal glands by which the saliva is secreted are six in number, three being situated on each side of the face, viz. the parotid, the submaxillary, and the sublingual glands. Of these the parotid is considerably the largest, and has been already described. [PAROTID GLAND.] The submaxillary gland, which is the next in size, has its principal mass situated immediately behind and beneath the middle of the base of the lower jaw, below the mylohyoideus muscle, round the posterior edge of which a portion of it is continued, and leads to the submaxillary or Whartonian duct. The latter passes forwards and inwards, and opens on the surface of the mucous membrane of the mouth, just by the side of the frænum of the tongue. The sublingual gland is the smallest of the chief salivary glands; it is situated close by the duct of the submaxillary, into which several of its ducts open; others have their orifices on the surface of the mucous membrane of the mouth, by the side of the frænum linguæ, and further outwards. Besides these larger glands there are a vast number more which secrete saliva, and which are situated in the substance of the lips and cheeks immediately beneath their mucous membrane, on whose surface their ducts open. Indeed the whole interior of the lips and cheeks is lined by a congeries of small glands, which in structure closely resemble the salivary, and probably do not differ from them in function.

The saliva which is secreted by these glands, according to the general laws of secretion [Gland; Secretion], is, when not mixed with air, a transparent, rather viscid fluid, which is usually weakly alkaline, but during the mastication of food is often slightly acid. It is composed of a great proportion of water, mixed with portions of the epithelium of the mucous membrane lining the mouth, and holding in solution about seven parts in one thousand of albumen, salivine (a principle almost peculiar to itself), and other animal matters, together with the saline substances found in the blood, and a very minute quantity of sulpho-cyanide of potassium.

The purpose served by the saliva seems to be the softening of the food, with which it is intimately mixed in mastication. Whether it is of any further use in digestion than thus to fit solid food to pass along the œsophagus without pain, is at present uncertain. But for this purpose it is absolutely necessary; and glands for its formation exist in all classes of animals from the insects upwards (with the exception of fish), and even in many that are lower in the animal kingdom than the insects. In all these it appears to serve the same purpose; the peculiar properties ascribed to the saliva of some animals being for the most part drawn from erroneous observations. The poison of venomous snakes, for example, is secreted by glands quite distinct from those which form their saliva; the saliva of the toad is perfectly harmless; and that of rabid animals is probably not more poisonous than the other fluids of their bodies; only under ordinary circumstances it alone is inserted into the wounded part.

The quantity of saliva secreted when the mouth is at rest is only sufficient to keep its internal membrane moist and slippery. When, however, the jaws are actively moved, and especially during feeding, or even at the thought of a meal or of certain kinds of palatable food, the quantity is greatly increased. During the twenty-four hours it is probable that from sixty to ninety grains of saliva are secreted by one parotid gland (Mitscherlich), and the quantity produced by all the salivary glands of an adult man together may therefore be estimated at from four to five hundred grains.

With the exception of the parotid, which is often the seat of inflammation [Mumps], abcess, and malignant disease [Parotid Gland], the salivary glands are remarkably little obnoxious to disorder. The most common affection is an accidental closure of their ducts by calculous matter or otherwise, when small cysts similar to those called Ranulæ [Ranula] form. These are often met with about the lips; they rarely need surgical treatment, but when they do, that adapted to ranula may be employed. The only other affection worth noticing is treated of in the following article.

SALIVATION, or PTYALISM, is a superabundant secretion of saliva. This sometimes occurs as an idiopathic disease, originating without any evident cause. Dr. Christison (*Treatise on Poisons*) has collected several such cases, in some of which the quantity of saliva discharged amounted to three or more pints daily. Irritation of the salivary glands, accompanied with profuse secretion, is also an occasional attendant on common inflammations of the throat and mouth, and on those that accompany eruptive diseases, especially small-pox. But far more frequently salivation is the effect of medicines or poisons. Some preparations of gold, copper, antimony, and iodine, croton oil, digitalis, and even opium, are apt to produce it; and it is almost a constant effect of the long-continued or copious administration of mercury.

The quantity of mercury required to produce salivation varies greatly in different persons. In some, two or three grains of calomel are sufficient; but by other persons such large quantities may be taken with impunity, that they appear insusceptible of its action. No general rule therefore respecting the quantity of mercury that may be safely given to any one can be made; but in no case can there be safety without caution and careful watching of [illegible] produced by it.

Salivation from the use of mercury is distinguished [illegible] that which arises from other causes, by its being [illegible] by a peculiar brassy taste in the mouth, fœtor of [illegible] and tenderness, redness, and sponginess of the [illegible] are soon followed by the increased flow of [illegible] mercury be still taken, or if the quantity already [illegible] very large, they increase; the whole mouth, to[illegible] and throat become swollen and tender, and [illegible] sloughs quickly form on the mucous membrane. [illegible] treme cases the mouth and cheeks and throat bec[illegible] tensively gangrenous, the teeth fall out, the [illegible] as they do in scurvy, the jaws are affected with [illegible] by the spreading of the disease to important [illegible] prove fatal; or the patient may die exhausted [illegible] fuse discharge of saliva, or by the peculiar [illegible] other constitutional disturbances that often a[illegible] poisonous influence of mercury. [Mercury.]

The best treatment of mercurial salivation is [illegible] cool pure air, a nutritious diet, and mild purg[illegible] gles of chloride of soda are useful in correcting th[illegible] the breath; and honey, or the *Mel Boracis*, may b[illegible] to the smaller ulcers in the mouth. The more [illegible] ulcerations and the gangrene can be treated [illegible] taining the patient's strength by tonics and [illegible] by the usual local applications to such diseas[illegible] pathic kinds of salivation usually require only [illegible] gently reducing measures.

SALIX (Latin, *salix*, a willow), the name of a [illegible] plants, which, in conjunction with Populus [illegible] constitutes the natural order Salicaceæ. In [illegible] this is one of the most important genera of [illegible] pidity of their growth, the toughness and [illegible]ness of [illegible] wood, and their uses in medicine and the a[illegible] them to be extensively cultivated. But [illegible] cultivated and well known in most parts of [illegible] botanical arrangement of these plants pre[illegible] difficulties, and few genera have had more [illegible] spent upon them than Salix; and up to the present [illegible] the most able botanists differ as to the [illegible] species or varieties.

The genus Salix is known by possessing diœcious [illegible] catkins many-flowered, imbricated, composed of a [illegible] flowered flexible bract. The barren flowers have a [illegible] lateral abrupt gland, sometimes double; fil[illegible] 5, or more, longer than the bract, and in [illegible] bined; 2-lobed anthers, opening longitudi[illegible] flowers with a nectariferous gland; ovate, [illegible]-cell[illegible] seeded ovary; permanent terminal style, with 2 [illegible] which are notched and obtuse or cloven acute, [illegible] ing; ovate capsule composed of 2 revolute [illegible] and one cell; numerous minute oval seeds, [illegible] simple, upright hairs. The willows are c[illegible] the colder parts of the temperate regions [illegible] hemisphere. *S. herbacea* and *S. arctica* [illegible] the pole than any other woody plants. S. [illegible] native of China, Japan, Armenia, and the [illegible] Of all the species enumerated, only 17 are [illegible]

The willow was known to the Greeks [illegible] fact little has been added to our knowledge of [illegible] and uses of these plants since their time. On a[illegible] the flexible nature of their shoots and the t[illegible] woody fibre, they have always been used [illegible] making baskets, hoops, crates, &c., and for [illegible] great quantities are cultivated in this and other [illegible] The bark is made use of in the north of Euro[illegible] purpose of forming mats in the same manner as [illegible] the common linden-tree. In Tartary the wo[illegible] macerated and separated, and then spun into [illegible] which cloth is woven. Willows are much used in [illegible] nufacture of charcoal; and it has been proved [illegible] charcoal is superior to that procured from the w[illegible] other trees for the preparation of gunpowder. Th[illegible] all the willows contains the tanning principle, [illegible] ing to Sir H. Davy, some of the species, espe[illegible] *selliana*, *S. alba*, and *S. purpurea*, [illegible]ain as [illegible] oak itself. From the bark of some [illegible] principle called *salicin*, which acts [illegible] same manner as quinine, and is used f[illegible] The willow is considered as the emblem of [illegible] It is often associated with the yew and the [illegible] churchyard.

ıre extensively cultivated in this country as timber-
:e-wood, and for the purpose of making hoops and
c. In the culture of willows, one of the first points
led to is the determination whether the plant is
ıale. The female is generally the more vigorous
nt; and in consequence, where timber or coppice-
s, or rods for coarse basket-work are required, the
uld be grown. On the other hand, when tough
: rods for basket-making are required, the male
t to be selected. All willows that are intended
ods, hoops, poles, or timber-trees should annually
shoots. Hence the colder the climate, the drier
the soil in which they are planted, on account of
:y of ripening their wood. The willow grows na-
moist soil, and wherever planted, it should be
ı of water. Low moist bottoms, high banks of
ks, or ditches, are the best situations for planting
; wherever they are placed, care must be taken
il be drained, for although they require much
hey will not grow in a saturated soil.
lture of the willow as osiers and for hoops, great
ired in order to produce them in perfection. All
y be propagated by cuttings. There are how-
species that will grow from seeds; and probably,
l, they might be grafted as easily as other plants.
villows are liable to the attacks of various in-
n that account afford a valuable field for entomo-
arch. The larvæ of cossus ligniperda, ceram-
ıtus, and nitidula grisea are found in the wood
ows, on which they feed, and in general they are
s as to destroy the tree in a few years. Crypto-
pathi is an insect that frequently commits great
ier-grounds. The larva of the lunar hornet
chilium crabriforme) bores the trunk of S.
feeds upon the living wood, and thus destroys
'he following insects are also recorded as attack-
ıg on willows: nematus capreæ, chrysomela vul-
ıe larvæ of brepha Parthenias, notodonta ziezac,
ıctæa, ptilodontes palpina, gastropacha querci-
ca capreæ, the larva of pyrochroa rubens, mela-
i and tremula, balaninus salicivorus, tachyerges
ı salicis, coccus capreæ, and c. salicis.
hat the species of this genus may be studied
, a number of points require consideration, and
ely that an approach has been made to accuracy
:stigation. The flowers of the salix are subject
malies which have been productive of not a little
nd have sometimes led to the supposition
nus was an exception to the ordinary laws of
evelopment. The principal anomalies that
are: 1, male and female flowers occurring in
tkin; 2, stamens apparently changed into pistils;
accompanied by an imperfect pistil; 4, entire
e filaments of the stamen. In the study and
of the species, it is of importance that the ten-
:se anomalies should not be overlooked. An-
lty in the way of the study of this genus is the
of hybrids. This has been denied by Sir J. E.
s article 'Salix,' in Rees's *Cyclopædia:* he says,
) contradict another common opinion taken up by
ıo found a difficulty in discriminating the species,
:quently generate mule varieties. In a garden
twenty years almost every British willow, and
ners, have been cultivated together under our
and where abundance of seedling plants have
'ery season; though many of these have been
preserved for examination, no mule plant nor
riety has occurred. The greatest difference of
ed, and the strangest diversities of shape and
foliage and stipules, are seen, according to the
of each individual with respect to pruning,
tarving, felling, and allowing young shoots to
ın old root.' On the contrary, Koch, a German
ıo has published a commentary on this genus,
ı certainly studied it more profoundly and philo-
han any other writer, says, 'The variation of the
ırts is not the only difficulty with which the
udent in this genus has to contend. The great
hybrids, the existence of which in the genus
ıe can doubt, is another obstacle. No one will
of arrogance in assuming to know S. rubra and
ı; and yet on the banks of the Rednitz near
there are many thousand trees of these two species, and, at the same time, many intermediate forms which I can refer to neither species. The catkins of these afford no distinguishing marks; for what seem at one time to belong to the former species, at another time appear more clearly allied to the latter.' A few well-conducted experiments would soon set this question at rest.

In arranging and distributing the species, Koch has not followed the suggestions of Linnæus, or the arrangement of Sir J. E. Smith. He observes, 'that if the usual arrangement of the species be adopted, in which the sections are characterised by having the ovaries naked or pubescent, the leaves glabrous or downy, serrated or entire (as in Smith's 'English Flora,' &c.), then species widely separated by nature and habit must necessarily be grouped together, not to mention that these characters are in themselves liable to great changes.' With regard to the parts of most importance in the determination of species, Koch says, 'a character taken from the catkins appearing earlier than, at the same time with, or later than, the leaves, is of great importance; but one taken from the situation and insertion of the leaves is still more so. The capsule offers important characters; its length relatively to the gland, which is never wanting, is a very constant character, varying only in a few species. The colour of the young shoots varies greatly, often so much as to cause the varieties to appear distinct species. The form of the leaves in the same species, and even in the same plant, can never be depended upon. In some species they are serrated or entire, green or hoary on the under surface, and glabrous or hairy on the same plant. The same variation is common on the exterior of the ovaries. The bracteas are sometimes obovate, and only half the length of the ovary; and sometimes in the same species lanceolate, and reaching as far as the style. The style and stigma likewise vary in length, and are occasionally more or less cleft. Stigmas of a rose colour, and of a yellow colour, have been found in the same species. The stipules vary in size, but never in form; hence they afford the very best characteristics for distinguishing species.' (Koch, *De Salicibus Europæis Commentatio.*)

There are at present described about 220 species of Salix; of all which we shall not here give a description, but refer the reader to works that give a full account of the species, with their arrangement. (Koch, *De Salicibus Europæis Commentatio;* Hooker's *British Flora;* Loudon's *Arboretum et Fruticetum Britannicum.*) In this last work all the information that could possibly be collected with regard to this genus is to be found. We shall arrange here the more common species, under the heads Sallows, Osiers, and Willows. These terms are often applied to any of the species, but some have more frequently one of the designations than the other.

SALLOWS.

These are trees or low shrubs belonging mostly to Borrer's group Cinereæ, and are characterised by downy branches, and mostly obovate, grey, hoary, toothed, more or less wrinkled, and stipuled leaves, very veiny beneath Ovaries sericeo-tomentose.

Salix cinerea, grey sallow: stem erect; lower leaves entire, upper serrated obovate-lanceolate; glaucous downy and reticulated with veins beneath; stipules half-heart shaped, serrated; ovary silky, style short, stigmas mostly entire. It attains a height of 20 or 30 feet, and is abundant in England on banks of rivers and in moist woods.

Salix aquatica, water sallow: stem and branches erect; leaves slightly serrated obovate-elliptical, minutely downy, and rather glaucous beneath; stipules rounded, toothed; ovary silky, stalked, stigmas nearly sessile. This is also a British species and one which Koch has made a variety of *S. cinerea.* The olive-leaved sallow (*S. oleifolia*) is also referred by Koch to *S. cinerea.*

Salix aurita, round-eared sallow: branches trailing; leaves obovate, somewhat serrate, convex, obtuse with a small hooked point, hairy, and reticulated with veins on both sides; stipules roundish, convex, toothed; ovary silky, stalked, stigmas nearly sessile.

Salix caprea, goat willow: stem erect; leaves roundish-ovate, pointed, serrated, waved, pale, and downy beneath; stipules somewhat crescent-shaped; catkins oval; ovary stalked, ovate, silky; stigmas nearly sessile, undivided; capsules swelling. It is a native of Britain, and is distinguished early in the spring by putting forth its handsome yellow blossoms before other trees have assumed their foliage. The bark is much used for tanning, and the wood is used for making implements of husbandry. It is also grown for hoop-making, and in medicine the bark is sometimes used as a substitute for cinchona.

OSIERS.

The species of Salix called mostly by this name belong to Borrer's group Viminales, which are described as trees of a more or less considerable size with long pliant branches and lanceolate leaves; ovaries nearly sessile, hairy or silky; their styles elongated; their stigmas linear, mostly entire. Any willow however that has long pliant twiggy branches and is grown on this account is called an Osier.

Salix viminalis, common osier: leaves linear-lanceolate, obscurely crenate, white, and silky beneath; stipules very small, sublanceolate, branches straight and twiggy; ovary upon very short stalks, lanceolate; style elongated; stigmas long, linear, mostly entire. This is the species that is used for the various kinds of basket-work, bands, &c., and for this purpose is largely cultivated in this country.

Salix stipularis, auricled osier: leaves lanceolate, pointed, slightly wavy, obscurely crenate, soft and nearly naked above, white and downy beneath; stipules half-heart shaped, stalked, very large; gland cylindrical; ovary ovate, nearly sessile, stigmas linear, undivided. It is a native of England, and may be employed for the same purposes as *S. viminalis*, but is inferior to that species.

Salix incana, hoary osier: leaves linear-lanceolate, denticulated, covered on the under surface with a hoary tomentum; catkins arched, slender, almost sessile, subtended at the base with small leaves; capsule ovate-lanceolate, glabrous, stalked; the stalk twice the length of the gland; style elongated; stigmas bifid; bracteas sub-glabrous, ciliate, with short hairs. This species is found wild in the lower Alpine valleys, on the Pyrenees, Cevennes, Alps of Dauphiny, Switzerland, Tyrol, Austria, and Carpathia. Its distinct character renders it an interesting species to the botanist.

WILLOWS.

Amongst these we shall include a few species useful in the arts and medicine, belonging to the various groups into which Koch and Borrer have distributed the species of Salix.

Salix Russelliana, Russell or Bedford willow: leaves lanceolate, tapering at each end, serrated throughout, very glabrous; foot-stalks glandular or leafy; ovary tapering, stalked, longer than the bracteæ; style as long as the stigmas. A native of Britain, growing in marshy woods, osier-grounds, &c. This tree was first brought into notice by the late Duke of Bedford, and has on that account received its present name. The best history of it is to be found in the introduction to the Duke of Bedford's splendid work on willows, the *Salictum Woburnense*. It was a tree of this species that was a favourite with Dr. Johnson at Lichfield, and hence called Johnson's willow. It was lately destroyed by a hurricane, having attained a height of 60 feet and a girth of 13 feet. The growth of this species is very rapid, and as it may be extensively used for poles, &c., it is a profitable tree for growing in plantations. Its bark is said to contain as much tannin as the oak. The medical properties attributed to the bark of *S. fragilis* belong properly to this species. It acts as an astringent and tonic.

Salix alba, common white willow: leaves elliptical-lanceolate, pointed, serrated, silky on both sides; lower serratures glandular; stamens hairy; ovary smooth, almost sessile; stigmas deeply cloven; scales notched. It is a native of most countries of Europe, and is more extensively planted as a timber-tree than any other species. It grows rapidly, attaining a height of 30 feet in 10 or 12 years. Hundreds of miles of road between Moscow and the Austrian frontier are planted with this tree. The bark is used in the north of Europe both for tanning and dyeing. The wood is very useful, and is employed for making the handles of all sorts of instruments, in turnery, millwork, coopery, weather-boarding, &c. Willow hats and bonnets are made from the shavings of this willow. The bark may be used in medicine instead of *S. Russelliana*, but it is not so valuable. It is frequently called the 'Huntingdon Willow,' and under that name is recommended by Gilpin and others as an ornamental tree.

Salix Babylonica, the weeping willow: leaves lanceolate acuminate, finely serrated, glabrous, glaucous beneath; catkins protruded at the same time with the leaves; ovary ovate, sessile, glabrous. This, the most favourite species of the genus, is a native of Asia, on the banks of the E
near Babylon, whence its name; also of China, of
and other parts of North Africa. It is said that t
was introduced into England by the poet Pope.
with Lady Suffolk when she received a
bound with withes, which appeared alive,
planted it in his garden, which grew up, and a
came so well known as Pope's willow at Twic
is however more probable that it was introduc
botanist Tournefort into Europe. This tree is i
cultivated in this country and on the Continent.
of the greatest favourites in China, as might be i
its constant introduction into Chinese pictures.
on the banks of its native Euphrates, it was the
which the weeping daughters of Zion 'hanged the
(*Psalms*, cxxxvii.)

Salix pentandra, sweet bay-leaved willow:
leaves elliptico-lanceolate, acuminate, serrated
glabrous, with several glands at the base: o
glabrous, nearly sessile; style small;
one of the latest flowering willows, not
till the beginning of June. The flowers are
especially when bruised, resembling in some
sweet bay (Laurus nobilis), hence its name.
the most desirable species for planting in shrub
count of its late flowers, its deep green almo
leaves, its powerful fragrance, and compact
may be used for basket-work. Nees von Esenb
its bark as a medicine to that of any other species, on ac-
count of its aroma.

Salix purpurea, purple willow: branches trailing, decumbent; leaves partly opposite, obovate-lanceolate, serrated, very smooth, narrow at the base; stamen 1; stigmas very short, ovate, nearly sessile. It is a native of Britain, and is a shrub 2 or 3 feet high. It is characterised by the elegant slenderness of its twigs and the redness of its catkins, which make it desirable for the shrubbery. Of all the willows it possesses the largest amount of bitter principle in its bark, and on this account has been recommended for medicinal use.

Salix vitellina, the yellow willow: leaves lanceolate with glandular serratures, acuminate, more or less silky beneath often so above; ovaries lanceolate, sessile, glabrous; style short; stigmas bipartile; scales lanceolate. It is a native of Great Britain in hedges, osier-grounds, and other places. As an ornamental tree, it is very striking, both among evergreen and deciduous shrubs, on account of its bark possessing conspicuous colours.

Among these we have not referred to the f
species, which will be found fit for timber gro
attain a height of 30 or 40 feet in 20 years:—
long-leaved triandrous willow; *S. Meyeriana*,
low; *S. Amygdalina*, almond-leaved willow;
minata, long-leaved willow.

SALIX, MEDICAL PROPERTIES OF. The
species of willow have been long celebrated
gent and antifebrile qualities; but from the
of determining the species, it is not ascertain
is entitled to the preference. The Salix Russellia
to possess the greatest quantity of *tannin*; but the
principle termed *salicin* seems to exist in the lar
portion in the S. Helix, or Rose Willow; while the
tandra, L. (seu Laureæ, s. Laureolæ, the sweet or bay-
willow) possesses, both in its bark and leaves, the
amount of bitterness and resin, and a most balsamic
The barks of S. alba, S. fragilis, and S. caprea are
gathered, often indiscriminately. Whichever
selected, the bark should be stripped in spring fr
not less than three years or more than six ye
from trees growing in moist rather than sw
should be carefully dried in the shade. Th
a faint odour somewhat resembling bit
dried bark is devoid of odour. The taste
ginous, afterwards bitter and astringent.
astringency may be easily tested by adding
of the bark a solution of gelatine. Tincture of
does not affect it. (Davy's *Agricult. Chemistry*, p.
edit.) According to the analysis of Pelletier and Cav
the bark of S. alba contains a green fatty
that of Cinchona, a yellow slightly bitter
tannin, resinous extract, gum, wax,
acid, which with magnesia forms a s
water and alcohol. Since these
found.

ark possesses astringent, tonic, and febrifuge
ıich render it a valuable substitute for Cinchona,
:en suits the stomach better, it is well calculated
ment of agues among the poor. In debility of
ı and relaxation of the mucous membranes, it is
erviceable. In the latter cases, an infusion,
old water, of the powdered bark of Salix pen-
referable; but any of the others may be made
y the addition of bruised cinnamon bark.

e of Salicine is not ascertained. It has neither
properties. According to Herberger, it is a
ound of a vegetable alkali (*Salicina*) and a
rous acid. That it has febrifuge properties
testible, but they are much weaker than those
it must therefore be given in considerably
. It may be given in substance or solution, and
unction with many other salts, without under-
position or entering into combination.

. or SALE'. [MAROCCO.]

'S. [SALIX.]

STIUS. or SALU'STIUS, with his full name
LLUSTIUS CRISPUS, was born B.C. 86, in
consulship of Marius, at Amiternum, a town in
of the Sabines, near the sources of the Aternus.
plebeian family; his parents seem to have been
circumstances. He received instruction from
rian Atteius Philologus, who is said to have
n with an epitome of Roman history, from
ight choose subjects for his own composition.
ll. Gramm., c. 10.) The year in which he ob-
æstorship is not known, but he was tribune of
c. 52, in which year Clodius was killed by

s a strong opponent of the aristocratical party,
gly in his tribuneship took an active part in
gs instituted against Milo. (Asconius, *in Cice-*
p. 38, 45, 49, 50, 51, ed. Orelli.) In B.C. 50, he
from the senate by the censors Appius Claudius
on, xl. 63), in consequence, it is said, of his im-
ut there is no good authority for this statement
ds of his expulsion, while we know that Appius
onged to the Pompeian party, and that Sallust
he general fate of all Cæsar's friends. After his
m the senate, Sallust seems to have repaired to
p in Gaul, and to have accompanied him in his
aly. According to some accounts he was made
n after the battle of Pharsalia, B.C. 48; but we
ain that he was prætor in the following year (B.C.
present at the mutiny of Cæsar's troops in
which occasion he narrowly escaped with his
lii. 52.) He accompanied Cæsar the same year
here he was actively employed in the war (Hirt.,
c., c. 8, 34), and when Cæsar quitted Africa in
year (B.C. 46), he left Sallust governor of the
rt., *Ibid.*, c. 97), where, according to Dion Cas-
he acquired immense wealth by the plunder
ry. On his return home, Sallust built the
e at Rome, which was afterwards used by the
d was not destroyed till the time of Alaric.
me he is said to have married Terentia, the
of Cicero. He died, B.C. 34, four years before
Actium.

character of Sallust has been drawn in the
rs by many writers. He has been accused of
ounded profligacy, which has been represented
inexcusable on account of the praises he has
is works upon virtue and temperance. These
owever do not rest upon any sufficient autho-
ve except the tale told by Varro, that Sallust
in adultery with Milo's wife, and severely
the husband (Aul. Gell., xvii. 18), to which
the words of Horace (*Sat.*, i. 2, 41), 'ille
mortem cæsis,' refer, according to one of the
asts.

s a strong party-man. He thoroughly de-
ted the aristocratical party, and took no pains to
pinion. He had designated Pompey, the leader
cracy, as a man 'oris improbi, animo invere-
ccordingly it was only to be expected that his
r should be attacked and traduced in every
ner. Lenæus, the freedman of Pompey, wrote a
against Sallust (Suet., *De Ill. Gramm.*, 15);
cian under the early emperors, when it had become the fashion to praise the old Pompeian party, wrote a declamation against the character of Sallust, which is still extant, and falsely ascribed to Cicero. That Sallust was not better than his contemporaries may easily be believed, and there seems no reason for doubting the statement of Dion Cassius, that he followed the example of his contemporaries in plundering the province of which he was governor.

Sallust wrote a history of Catiline's conspiracy, and of the war with Jugurtha, and also a general history of Roman affairs from the death of Sulla, B.C. 78, to the appointment of Pompey to the command of the Mithridatic war, B.C. 67. The two first works have come down to us entire; but of the latter we have only fragments; and its loss is the more to be regretted as it contained an account of one of the most important periods of Roman history, respecting which our information is very meagre and unsatisfactory. It was written in five or six books, addressed to Lucullus, and appears to have contained an introduction, in which an acount was given of the civil wars between Sulla and Marius. It connected his histories of the Jugurthine war and the Catilinarian conspiracy. The only fragments of it of any length are four orations and two letters, which are characterised by Sallust's usual style.

The merits of Sallust, both as an historian and a philosopher, have been rated very low by many modern critics. The objections which have been made to the moral reflections and dissertations in Sallust's writings as unsuitable to the nature of historical compositions, have arisen from a want of due attention to the object which the historian had in view. This does not appear to have been so much the narration of the particular events which he chose as the subjects of his history, as the elucidation of certain great political facts. In his 'Jugurtha' his object was to show the venality and total want of principle in the aristocratical party, and how both their private and public profligacy at length deprived them of the power which they had possessed since the time of the Gracchi. In his 'Catiline' he had the same object to a certain extent in view, though here it was not to show how the vices of the aristocratical party occasioned their loss of power, but rather to describe the consequences to which those vices had at length led, for it must be remembered that Catiline and his associates had been brought up in the school of Sulla, and belonged to the aristocracy.

In estimating the value of Sallust's writings, it should also be borne in mind that the Romans possessed no works worthy of the name of histories before his time. Preceding writers merely narrated events according to the order of the years in which they happened, without any attempt to trace the causes and results of the events which they recorded. Sallust studiously avoided the annalistic style of his predecessors, and appears to have made Thucydides his model, to whom he is sometimes compared by the antients themselves. The fastidious critics of the Augustan age objected to the use of the antiquated words and expressions which Sallust sometimes employed (Suet., *De Ill. Gramm.*, 10), but it is no small proof of the excellence of Sallust's style that Tacitus closely imitated it.

Besides the works already mentioned, two epistles have come down to us under the name of Sallust, addressed to Julius Cæsar, on the management of the state ('De Republica Ordinanda'); but these are evidently not the work of Sallust, and are supposed by Niebuhr to have been written, at the latest, in the second century of the Christian æra. (*Römische Geschichte*, vol. iii., p. 401.) There is also extant a declamation against Cicero, falsely ascribed to Sallust.

The first edition of Sallust was published at Venice, in 1470. The edition of Cortius, which was published at Leipzig, in 1724, 4to., with a valuable commentary, has formed the basis of most of the subsequent editions. The best modern editions are those of Kritz, 2 vols. 8vo., Leipzig, 1828, 1834, which does not however contain the fragments, and of Gerlach, Basel, 1823-1831, 3 vols. 4to. An accurate edition of the text, with the principal various readings, but without explanatory notes, has been published by Orellius, Zürich, 1840, 12mo. The principal translations of Sallust into the European languages are, in English, by Gordon, Lond., 1769, 4to.; by Rose, 1757, 8vo.; and by Sir Henry Stewart, 2 vols. 4to.; in French, by De Brosses; in Spanish, by Gabriel de Bourbon, the son of the king of Spain, Madrid, 1772, 4to; in Italian, by Alfieri; and in German, by Gerlach, Prenzlau, 1827.

SALLUSTIUS, a Platonic philosopher, who lived in the fourth century of the Christian æra. He wrote a work in Greek, 'On the Gods and the World,' which was originally published by Leo Allatius, Rome, 1638, 12mo. The best edition of this work is by Orelli, Zürich, 1821, 8vo. It has been translated into French by Formey, Berl., 1748, 8vo., and into German, by Schulthess, Zürich, 1779, 8vo.

SALM. As far back as the tenth century, there have been in Germany two counties bearing the name of Salm: the county of Ober-Salm (with the rank of a principality) in the Vosges mountains, between Alsace and Lorraine, in the circle of the Upper Rhine; and the county of Nieder-Salm, in the Ardennes, between the duchy of Luxemburg and the bishopric of Liège, which subsequently made part of the circle of Burgundy. It would be equally tedious and useless to trace the division of the family of the counts of Salm into different branches, and the various changes of territory during a period of eight centuries. The two principal lines, subdivided into several branches, subsisted till the French revolution, during which their territories were annexed to France, and in the sequel other possessions were assigned them from the secularizations on the east of the Rhine. At present, the elder line is divided into three branches:—1, Salm-Salm, which possesses revenues from estates in Brabant and Holland, to the amount of 600,000 florins. 2 Salm-Kyrberg, whose revenues may amount to 180,000 or 200,000 florins. 3, Salm-Horstmar, which, after various changes during the French revolution, was placed, with the rank of a principality, under Prussia, from which it receives a perpetual annuity of 20,000 dollars, as an indemnity for the cession of the judicial and civil administration. The second line is that of Salm-Reifferscheid, divided into the four branches of 1, Salm Reifferscheid Kramtheim; 2, Salm-Reifferscheid-Raitz; 3, Salm-Reifferscheid-Hamspach; and 4, Salm-Reifferscheid-Dyk. Some of these are called princes, and others counts; they are all mediatised, that is, they have lost the exercise of their right as sovereigns, which is transferred to the members of the German confederation in whose dominions their possessions are.

SALMA'SIUS, CLAU'DIUS, the Latinized form of his real name **CLAUDE DE SAUMAISE**, was born near Sémur in Auxois, in the year 1588 or 1596, more probably the latter. His father, who was a member of the parliament of Burgundy, was a person of considerable learning; he translated the work of Dionysius of Alexandria into French verse, Paris, 1597, 12mo. Young Salmasius was educated at home by his father, and is said to have made such astonishing progress in his studies as to be able to read Pindar at ten years of age, and to write Greek and Latin verses with fluency and correctness. At the age of sixteen he was sent to Paris to prosecute his studies, where he became acquainted with Casaubon, by whose influence he was induced, contrary to the wish of his father, to embrace the Reformed faith. From Paris he went to Heidelberg, where he made a formal renunciation of the Roman Catholic religion, in which he had been educated. At Heidelberg he obtained the friendship of the jurist Denys Godefroy and of Gruter, who appreciated his talents, and recommended him to the notice of all the great literary men in Germany. During his stay in this city, he prosecuted his studies with the greatest perseverance, and perused not only the Greek and Latin writers which were then published, but also numerous others, which existed in manuscript in the university library. He devoted the whole of every third night entirely to study, till at length his excessive application occasioned a long and serious attack of illness. About this time (1608) his first publication appeared, which was an edition of a treatise in Greek by Nilus, archbishop of Thessalonica, on the primacy of the pope, and also of another work on the same subject, by a monk of the name of Barlaam, both of which were accompanied with a Latin version and a few notes. He published soon afterwards an edition of Florus, Par., 1609, 8vo., which he dedicated to Gruter. After spending three years in Germany, he returned to France, and shortly after his return published a short treatise 'De Suburbicariis Regionibus et Ecclesiis,' in opposition to Sirmondus. In 1620 he published his edition of the 'Historiæ Augustæ Scriptores Sex,' fol., which Casaubon, shortly before his death, had intended to edit as a sequel to his edition of Suetonius. The commentary of Salmasius on these writers is full of valuable information, and may still be consulted with profit. In 1622 Salmasius published his edition of Tertullian's work 'De Pallio,' with a commentary, in which he treats at great length of the different garments worn by the antients.

In the following year (1623) Salmasius married the daughter of Mercier, who was a person of elevated rank, and is frequently mentioned by his son-in-law in terms of the highest praise both for his learning and talents. From the time of his marriage Salmasius resided for many years in the neighbourhood of Paris, chiefly engaged in the preparation of his great work, which was published at Paris in 1629, 2 vols. fol., under the title of 'Plinianæ Exercitationes in Caii Julii Solini Polyhistora,' and reprinted at Leyden in 1689, with an appendix entitled 'De Homonymis Hyles Iatricæ Exercitationes, necnon de Manna et Saccharo.' The treatise of Solinus [SOLINUS] was evidently selected by Salmasius on account of its treating of so many various subjects in antiquity, and thus enabling him to discuss without the trouble of systematic arrangement almost any subject which he chose. It is a work of astonishing erudition; not only does it embrace questions connected with Greek and Roman history, geography, and archæology, but it also treats at great length of the plants, herbs, and minerals known to the antients. In order to qualify himself more completely for the work, Salmasius studied the Hebrew, Persian, and Arabic languages, with which he shows an extensive acquaintance. The work is however written in a very confused manner, and embraces too many subjects to be thoroughly treated of by one man. In this, as well as in most of his other writings, Salmasius frequently shows great carelessness in the statement of facts, combined with much arrogance and pretension.

Upon the publication of this work the rep[illegible] of [illegible] masius reached its greatest height. He was [illegible] various princes and states to settle in their d[illegible] was invited by the Venetians, by the unive[illegible] and even by the pope; but he declined all t[illegible] and at length settled at Leyden in 1632, [illegible] a public salary, but did not discharge [illegible] fessor.

Upon the death of his father in 1640, Salmasius returned to France to settle his father's affairs; and [illegible] Richelieu pressed him to remain in his native c[illegible] also offered him a very large pension if he would wr[illegible] Life. After the death of Richelieu, Mazarin renewed [illegible] offers of Richelieu, but Salmasius resisted all their [illegible] tions, and returned to Leyden, where he remained t[illegible] when he went to Sweden to pay a visit to [illegible]een Christina, who had written him the most pressing inv[illegible]n, and said she could not live happy without him. [illegible] Sweden however did not agree with him, and he [illegible] returned in the following year.

After the death of Charles I. of England, S[illegible] employed by Charles II., who was then in Hol[illegible] a defence of his father and of monarchy, and wh[illegible] cordingly did, and published under the title of '[illegible] Regia pro Carolo I.,' 1649; to which Milton repli[illegible] 'Defensio pro Populo Anglicano.' [MILTON.] [illegible] prepared a reply to Milton, but did not live to fi[illegible] died in September, 1653.

In addition to the works which have been mentioned [illegible] the course of this article, Salmasius also wrote and [illegible] the following works: 'De Usuris,' Leyd., 1638, 8vo.; [illegible] Modo Usurarum,' Leyd., 1639, 8vo.; 'Dissertatio de Fœ[illegible] Trapezitico, in tres libros divisa,' Leyd., 1640; 'N[illegible] Pervigilium Veneris,' Leyd., 1638, 12mo.; Com[illegible] in Simplicii Enchiridion Epicteti,' Leyd., 1640, [illegible]; [illegible] terpretatio Hippocratei Aphorismi de Calculo,' Leyd., [illegible] 8vo.; 'De Hellenistica Commentarius Controversiam Lingua Hellenistica decidens, et plenissime pertr[illegible] Origines et Dialectos Græcæ Linguæ,' Leyd., 16[illegible]; 'Observationes in Jus Atticum et Romanum,' Leyd., 1645, 8vo. A collection of Salmasius's Letters was publ[illegible] Antony Clement after his death, to which his [illegible] prefixed, Leyd., 1656.

SALMON, NATHANIEL, the son of the Rev. [illegible] Salmon, was admitted of Corpus Christi College, C[illegible] in 1690. He entered into holy orders, and obtained a c[illegible] in Hertfordshire, but abandoned the clerical profession [illegible] that of medicine, in the practice of which, and in the [illegible] of antiquities, he passed the remainder of his life. [illegible] on the 2nd of April, 1742.

His principal works are: 'A Survey of the [illegible] tions in Britain according to the Roman I[illegible] 8vo.; 'A Survey of the Roman Stations in ounties in England,' 1726, 8vo.; 'History of Hertfordiire,' Lond., 1728, fol.; 'Antiquities of Surrey,' Lond., 1736, ro.; 'History and Antiquities of Essex, from the Collecons of Mr. Strangeman,' Lond., 1740, fol.

SALMON. [SALMONIDÆ.]

SALMON FISHERY. [FISHERIES.]

SALMO'NIDÆ (Salmon tribe), a family of fishes benging to the Malacopterygii Abdominales. These fishes ave the body covered with scales, the first dorsal fin has ft rays only, and the second dorsal is small and destitute rays, and of a soft fleshy nature; they are furnished with air-bladder, and have numerous cæca. The more typical ecies appear to be confined to the northern hemisphere.

The genus *Salmo*, as at present restricted, contains those ecies, such as the salmon and trout, in which the upper undary of the mouth is formed chiefly by the superior axillary bones, the intermaxillaries being small, confined the fore-part, and situated between the maxillaries; ually these latter bones descend in front of the superior axillaries, and form the upper boundary of the mouth. e maxillary bones, intermaxillaries, palatines, vomer, and en the tongue, are furnished with teeth; the branchiosus rays are about ten in number; the natatory bladder, ir-bladder, extends the whole length of the abdomen.

Numerous species of this genus are found in the seas of e northern hemisphere, one of the largest of which is the mmon salmon (*Salmo salar*, Lin.), a fish too well known th in flavour and appearance to require any particular scription. This fish, Cuvier states, is found in all the rctic Seas, whence it enters the rivers in the spring. Mr. arrell observes that fishes ascend the rivers in some uations much earlier than others, depending on the time their arrival into breeding condition. 'Rivers issuing om large lakes afford early salmon, the waters having been rified by deposition in the lakes; on the other hand, rivers ollen by melting snows in the spring months are later in eir season of producing fish, and yield their supply when e lake rivers are beginning to fail. "The causes influencing is," says Sir William Jardine, "seem yet undecided; and ere the time varies much in the neighbouring rivers of e same district, they are of less easy solution. The northern vers, with little exception, are however the earliest, a fact ll known in the London markets; and going still farther rth, the range of the season and of spawning may be inenced by the latitude."' Artedi says, in Sweden the salon spawn in the middle of summer. From some further servations in Mr. Yarrell's excellent work, it appears that e temperature of the water has considerable influence.

The number of fishes procured for food increases as the mmer advances; 'during the early part of the season the lmon appear to ascend only as far as the river is influenced the tide, advancing with the flood, and generally retiring th the ebb, if their progress be not stopped by the various eans employed to catch them. It is observed that the male fishes ascend before the males; and the young fish the year, called grilse till they have spawned once, ascend rlier than those of more adult age. As the season adnces, the salmon ascend higher up the river, beyond the fluence of the tide; they are observed to be getting full roe, and more or less out of condition, according to their rward state as breeding fish. Their progress forwards is t easily stopped; they shoot up rapids with the velocity arrows, and make wonderful efforts to surmount cascades d other impediments by leaping, frequently clearing an evation of eight or ten feet, and, gaining the water above, sue their course. If they fail in their attempt and fall ck into the stream, it is only to remain a short time iescent, and thus recruit their strength to enable them to ake new efforts.

'The fish having at length gained the upper and shallow ols of the river, preparatory to the important operation of positing the spawn in the gravelly beds, its colour will be und to have undergone considerable alteration during the dence in fresh water. The male becomes marked in the eks with orange-coloured stripes, which give it the aprance of the cheek of a *Labrus*; the lower jaw elongates, d a cartilaginous projection turns upwards from the point, hich, when the jaws are closed, occupies à deep cavity beeen the intermaxillary bones of the upper jaw; the body rtakes of the golden orange tinge, and the salmon in this ate is called a red-fish. The females are dark in colour, are as commonly called black-fish; and by these terms are designated in those local and precautionary regulations intended for the protection and preservation of the breeding fish.'

The process of spawning is thus described in Ellis's 'Memoir on the Natural History of the Salmon:'—'A pair of fish are seen to make a furrow, by working up the gravel with their noses, rather against the stream, as a salmon cannot work with his head down stream, for the water, then going into his gills the wrong way, drowns him. When the furrow is made, the male and female retire to a little distance, one to the one side and the other to the other side of the furrow; they then throw themselves on their sides, again come together, and, rubbing against each other, both shed their spawn into the furrow at the same time. This process is not completed at once; it requires from eight to twelve days for them to lay all their spawn, and when they have done they betake themselves to the pools to recruit themselves. Three pairs have been seen on the spawning-bed at the same time, and even closely watched while making the furrow and laying the spawn.

'The adult fish having spawned, being out of condition and unfit for food, are considered as unclean fish. They are usually called kelts; the male fish is also called a kipper, the female a baggit. With the floods of the end of winter and the commencement of spring they descend the river from pool to pool, and ultimately gain the sea, where they quickly recover their condition, to ascend again in autumn for the same purpose as before, but always remaining for a time in the brackish water of the tideway before making either decided change, obtaining, it has been said, a release from certain parasitic animals, either external or internal, by each seasonal change, those of the salt water being destroyed by contact with the fresh, and *vice versâ*.' It is moreover probable that the constitution of the fish is such as to require a gradual change; that the salmon is considerably affected in passing from the salt water into the fresh, is evident from the change of colour which accompanies the difference of the state of the element.

To Mr. John Shaw of Drumlanrig, Dumfriesshire, naturalists are indebted for numerous important and interesting experiments instituted by him to determine certain doubtful points connected with the natural history of the salmon, and more especially to determine the developments and growth of the salmon-fry. Mr. Shaw's first paper, entitled 'An Account of some Experiments and Observations on the Parr, and on the Ova of the Salmon, proving the Parr to be the Young of the Salmon,' will be found in the 'Edinburgh New Philosophical Journal' for July, 1836, vol. xxi. His second paper, in which he gives an account of 'Experiments on the Development and Growth of the Fry of the Salmon, from the Exclusion of the Ovum to the Age of Six Months,' is published in the same work, vol. xxiv., p. 165; and lastly in the 'Transactions of the Royal Society of Edinburgh,' vol. xiv., p. 547, the author gives a summary of the preceding papers, and adds the result of further investigations.

The author, who has lived the whole of his life, with the exception of a few seasons, on the banks of streams where salmon are in the habit of depositing their spawn, had long been of opinion that the fish commonly called the *parr*, and supposed to be a distinct species from the salmon, was the natural produce of the salmon; and in order to satisfy himself of the development of this fish, he caught seven specimens of the parr on the 11th of July, 1833, and placed them in a pond supplied by a stream of wholesome water. There they continued to thrive remarkably well, and were seen catching flies and other insects, or sporting on the surface in perfect health. In the month of April following (1834), they began to assume a different aspect from that which they exhibited when first placed in the pond, and upon catching some of them in May, they were found to have assumed the usual appearance of what are called salmon smolts or fry, being of a fine deep blue on the back, with a delicate silvery appearance on the sides of the body, and having the abdomen white. 'A circumstance occurred about the first week of May,' observes the author, 'which it may be proper to mention as illustrating in a manner what may be deemed the migratory instinct of these fishes. They seemed to me at this time to be decreasing in numbers, and I found, on examination, that some had leapt altogether out of the pond, and were lying dead at a short distance from the edge.' 'In March 1835, I again took twelve parrs from the river, of larger size, that is, about six inches long; they then bore the perpendicular bars, and other usual characters of that fish. These I also transferred to a pond prepared for the purpose, and by the end of April they too assumed the characters of the salmon-fry; the bars becoming overlaid by the new silvery scales, which parrs of two years old invariably assume before departing towards the sea. From these experiments I had no doubt that the larger parrs observable in rivers in autumn, winter, and early spring, were in reality the actual salmon-fry advancing to *the conclusion of their second year*, and that the smaller summer parrs (called, in Dumfriesshire, May parrs) were the same species, but younger as individuals, and *only entering upon* their second year. This then I conceived to be the detection of the main error of preceding observers, who had uniformly alleged that salmon-fry attain a size of six or eight inches in as many weeks, and after the lapse of this brief period take their departure to the sea. It is the rapidity with which the two-year-old parr assumes the aspect of the salmon-fry that has led to this false conclusion; and superficial or hasty observers, taking cognizance, 1st, of the hatching of the ova in early spring, and 2ndly, of the seaward emigration of smolts soon afterwards, have imagined these two facts to take place in immediate or speedy succession.' The author next proceeds with the history of the young salmon during its early stages up to the time of its becoming what is termed the May or summer parr, and then gives the results of his various experiments on the ova of the salmon, undertaken with a view to prove the identity of these two fish. Having procured the eggs of the salmon, he placed them in a pond made for the purpose, and succeeded in rearing them. 'On its first exclusion the little fish has a very singular appearance. The head is large in proportion to the body, which is exceedingly small, about five-eighths of an inch in length, of a pale blue or peach-blossom colour. But the most singular part of the fish is the conical bag-like appendage which adheres by its base to the abdomen. This bag is about two-eighths of an inch in length, of a beautiful transparent red, very much resembling a light-red currant; and in consequence of its colour, may be seen at the bottom of the water when the fish itself can with difficulty be perceived. The body also presents another singular appearance, namely, a fin or fringe, resembling that of the tail of the tadpole, which runs from the dorsal and anal fins to the termination of the tail, and is slightly indented. This little fish does not leave the gravel immediately after its exclusion from the egg, but remains for several weeks beneath it with the bag attached, and containing a supply of nourishment, on the same principle, no doubt, as the umbilical vessel is known to nourish other embryo animals. By the end of fifty days, or the 30th of May, the bag contracted and disappeared. The fin or tadpole-like fringe also disappeared by dividing itself into the dorsal, adipose, and anal fins, all of which then became perfectly developed. The little transverse bars, which for a period of two years (as I have already shown) characterize it as the parr, also made their appearance. Thus from the 10th of January to the end of May, a period of upwards of 140 days was required to perfect this little fish, which even then measured little more than one inch in length, and corresponded in all respects with those on which I had formerly experimented, as well as with such as existed at that same time in great numbers in the natural streams.' More experiments were afterwards made, with still greater precaution, by Mr. Shaw, and the same conclusions were arrived at.

The salmon has been known to attain upwards of eighty pounds weight, but a salmon of half that size is considered a fine fish: 'the largest known, as far as I am aware,' observes Mr. Yarrell, 'came into the possession of Mr. Groves, the fishmonger of Bond Street, about the season 1821. This salmon, a female, weighed eighty-three pounds; was a short fish for the weight, but of very unusual thickness and depth. When cut up, the flesh was fine in colour, and proved of excellent quality.'

Salmon have been kept in fresh-water lakes and other pieces of water having no outlet to the sea; these fish however, though of tolerable good colour and flavour, did not obtain the size of those which visited the sea annually. They are caught by nets of various kinds, which are described in Mr. Yarrell's 'History of British Fishes,' where there will also be found an account of the various other British species of *Salmo*. The following are the principal genera of the *Salmonidæ*:—

Genus *Osmerus*.—Of this genus the common smelt (*Osmerus eperlanus*) affords a familiar example. The smelts differ from the species of Salmo in having two ranges of teeth in each palatine bone, but there are only a few in front of the vomer: they have eight branchiostegous rays; the ventral fin is on a line with the anterior dorsal. They are taken in the sea, and at the mouths of great rivers. Mr. Yarrell, in the supplement to his volumes on British fishes, describes a new species of the present genus, which he names the Hebridal Smelt (*Osmerus Hebridicus*), a name suggested by the locality in which the specimen was found.

Genus *Mallotus*, Cuvier.—This genus is founded on a single species, the *Salmo Grœnlandicus* of Bloch, a small fish employed as a bait in the cod fisheries: its teeth are dense, like the pile on velvet, in both jaws, as well as the palate and tongue; the branchiostegous rays are eight in number; the body is elongated and covered with small scales; the anterior dorsal and ventrals are situated rather behind the middle of the body; the pectorals are large and rounded, and almost meet beneath.

Genus *Thymallus*, Cuvier.—Of this genus the Grayling (*Thymallus vulgaris*) is the type. This fish is common in some of our streams, but is a local species; it differs chiefly from the trouts or salmons in having the mouth less deeply cleft, the orifice square, the anterior dorsal very high, and the scales larger.

Genus *Coregonus*, Cuvier.—Here the teeth are very small, and the species are often edentate; the scales are very large, and the first dorsal is not so long as it is high in front. Numerous species of this genus are found in Europe. The Gwyniad (*Coregonus fera*, Yarrell) and the Vendace (*C. Willughbii*, Jardine) afford British examples of the genus. 'The Gwyniad of Wales,' says Mr. Yarrell, 'was formerly very numerous in Llyn Tegid (Fair Lake) at Bala, until the year 1803, when pike were put into the lake, which have very much reduced their numbers.' It is very numerous in Ulswater and other large lakes in Cumberland.

The Vendace was originally described by Sir [illegible] Jardine, in the third volume of the 'Edinburgh [illegible] of Natural and Geographical Science.' This au[illegible]sidered the fish in question as very closely alli[illegible] *Salmo albula* of Linnæus, but the difficulty of det[illegible] this point has induced him to apply to it the n[illegible] distinguished naturalist. It is only known to [illegible] locks in the neighbourhood of Lochmaben in [illegible]shire.

Genus *Argentina*, Linnæus.—But one species (*Argentina sphyræna*, Linn.) of this genus is known, an inhabitant of the Mediterranean. This fish has the mouth horizontally depressed; the tongue is armed, as in the trouts and smelts, with strong curved teeth; in front of the vomer is a transverse range of little teeth; the branchiostegous rays are six in number; the air-bladder is very thick, and loaded with that silvery substance which is used in colouring artificial pearls.

Genus *Crumata*, Cuvie[illegible].—These are *Salmonidæ* [illegible] same general form and small mouth, as observed [illegible] Graylings, but differ in the number of the bran[illegible] rays.

Genus *Anastomus* of Cuvier differs chiefly from the [illegible] in having the lower jaw turned up in front of the [illegible] one, and gibbous, so that the little mouth appears [illegible] vertical slit at the end of the muzzle. The species inhabit the rivers of South America.

The genus *Gusteroplectus* of Bloch also has the o[illegible] of the mouth directed upwards, but the abdomen [illegible]pressed and prominent; the ventrals are very small [illegible] back; the first dorsal fin is situated over the anal, which [illegible] long; in the upper jaw are conical teeth, and in the lower the teeth are sharp and denticulated.

The species of the next genus, *Serasalmo*, are re[illegible]ble for the short, high, and compressed form of the [illegible] which is furnished with small scales; their teeth are sharp, of a triangular form, and denticulated; there is often [illegible] adpressed spine in front of the dorsal fin. They inhabit [illegible] rivers of South America. To these [illegible] be added [illegible] genera *Tetragonopterus* of Artedi, *Chu*[illegible] [illegible]*letes*, [illegible]*drocyon*, *Citharinus*, *Saurus*, *Scopelus*, and [illegible] Cuvier, and *Sternopteryx* of Herman.

SALOMON, JOHANN-PETER, a [illegible] a violinist of the very highest rank, and [illegible] terprising promoter of music, was born at [illegible], in 1745, and educated for the profession of the civil [illegible] like many others, having been led away from so dry a pursuit by at least one of the Muses, he was allowed to indulge his favourite inclination, and soon became celebrated not only for his performance on the violin, but for his knowledge of the harmonic art in all its branches.

When young he entered the service of Prince Henry of Prussia, at Berlin, who soon became much attached to his youthful musician. For this accomplished and amiable prince he composed several French operas. He afterwards accepted an invitation to Paris, in 1781, where he met with abundance of empty praise, but speedily sought the ish shores, in hope of obtaining more solid reward, and not disappointed. Arriving in London, he was imme- ely introduced to all the amateurs, among whom were y of the nobility, and his cheerful disposition, superior nners, and good sense soon obtained for him the friend- of those who at first patronised him on account of his sional talents. In 1790 he formed the project of ng a series of subscription-concerts, and carried it into t, in the most spirited manner, the following year. se constitute an epoch in musical history, for they led he production of those twelve grand symphonies by dn, known everywhere as 'composed for Salomon's Con-'—works of an imperishable nature, because founded mutable principles, and embodying all that is beautiful e class of art to which they belong. A further account these, and of the concerts, will be found in our biogra- ical sketch of HAYDN.

In 1798 the oratorio of *The Creation* was produced at the era concert-room, at the risk and under the direction of . Salomon. In 1801 he, in conjunction with Dr. Arnold Madame Mara, opened the Haymarket theatre, during , with oratorios; and in the same year gave five sub- ption-concerts. As a professional man he now retired om public life, and chiefly occupied his time in attending Carlton House, in composing two sets of canzonets, some ngs, glees, &c., and in publishing these, together with x violin solos and two grand violin concertos, arranged for e piano-forte. But at the formation of the Philharmonic ociety, in 1813, he nobly contributed his services as a ilettante, and led the first concert 'with a zeal and ability t age had in no degree impaired.' He died in 1815, and remains were deposited in the great cloister of West- er Abbey, followed by a long train of friends, by whom was most highly and deservedly esteemed; for his edu- tion had been liberal, his acquirements were numerous, cluding a perfect knowledge of four living languages, and is habits were those of a gentleman, in the best sense of word.

SALON, a town in the department of Bouches du Rhône France, on a cross-road from Arles to Aix. A Roman n appears to have existed on the site, and an inscription ich has been dug up shows that there was a temple ected in honour of Tiberius Cæsar; but the present town ppears to have risen under the first Counts of Provence. alon stands in a plain on one of the branches of the canal f Carponne, which is used for irrigation. The central rt, called Vieille or Old Salon, was surrounded with walls, which only one tower with battlements and some other ns remain. This old town is irregularly laid out; and ld houses, and a church built in the thirteenth century e Templars. The outer part, called Nouvelle or New lon, is separated from the old town by a boulevard anted with trees and adorned with fountains, and consists f streets well laid out, and lined, especially the boulevard, ith tolerably good houses. There are a church, a large market-place, and a castle, now used as a prison, situated on a rock verlooking the Crau, an immense stony plain south-west of the town. The population of Salon in 1831 was 4187 for the town, or 5987 for the whole commune. Hats, soap, and candles are manufactured; and there are oil-mills and silk-throwing- ls. The townsmen carry on trade in these articles, and wool, cattle, olive oil, and almonds. There are five fairs he year. Michael Nostradamus died at Salon, where his Michael Nostradamus the historian was born.

SALO'NA, Bay of. [PHOCIS.]

SALONI'KI. [THESSALONICA.]

SALOON (from the Italian *sala* and its augmentative *salone*) signifies, in its stricter architectural meaning, a room answering in some respect to the idea of a *hall*, that is, not only the principal room as to spaciousness, but loftiness also, *height* belonging to the character of a saloon in like manner as *length* does to that of a gallery. Thus if the plan be square, the proportions may vary from those of a cube to a cube and a half, or even more in height, but should never be much less than the first-mentioned. Like all others however, this rule admits of exceptions, because a room may be both lofty in itself and in comparison with the others in a building, although its proportions may not be strikingly so. It is further usual for a room of this description to be either a perfect square in plan or of some shape that can be inscribed within such figure, that is, circular, octagonal, or some other regular polygon. At present however the term is not understood in so strictly technical a sense, but the name of saloon is indiscriminately or ostentatiously bestowed on any unusually large room, be its proportions and character what they may, even though it would answer better to that of gallery. Except that it is not used for banquets, the saloon may be considered, in modern residences, what the hall was in the mansions of 'olden times.' Its destination differs from that of drawing-rooms and other apartments of that kind, as serving rather as an approach to and communication between them, and as a room of general rendezvous for the visitors at a house. Blenheim, Castle Howard, and other mansions erected by Vanbrugh, have lofty and stately saloons; but one of the most splendid examples of the kind would have been that designed by Adam, and published in his works, for Sion House, the inner court of which he proposed to convert into a magnificent rotunda [ROTUNDA] enclosed within a circular or ring-shaped gallery, with openings from one to the other between columns, and with niches in the intermediate piers.

SALPA. [SALPACEA.]

SALPA'CEA. Lamarck places the genus *Salpa* in his third section of *Tunicata* (*Tuniciers libres ou Ascidiens*), with the following definition: 'Animals disunited, either isolated or assembled in groups, without internal communication, and not forming essentially a common mass.' These form his second order of *Tunicata*, with the title above given, and consist of the genera *Salpa*, *Ascidia*, *Bipapillaria*, and *Mammaria*. *Pyrosoma* is arranged under his second section: 'Animals floating with their common mass in the bosom of the waters,' in his first order (*Tuniciers Réunis ou Botryllaires*).

M. de Blainville (*Malacologie*) makes the *Salpacea* the second family of his fourth order *Heterobranchiata*, with the following character:—

Body free, or not adherent, more or less cylindrical, with a thick external envelope, which is subcartilaginous, transparent, pierced with two apertures, which are ordinarily very large and distant, nearly terminal, one incrementitial, the other excrementitial. The branchiæ, in the form of a narrow band, traverse obliquely the respiratory cavity of the incrementitial orifice to the aperture of the mouth.

M. de Blainville remarks that one may easily perceive the relationship of this family to the other *Acephalophora*, by supposing an *Ascidia* slit between the two tubes which terminate it and then extended lengthwise. It is then, he observes, easy to determine the analogy of the apertures, of which neither the one nor the other are any more the mouth and the anus than in the *Ascidiæ*; but one (the widest, the greatest, and the most distant from the mouth) is the entrance of the incretory or respiratory tube, and the other is that of the excretory tube. He adds that the species of this family are, like those of the preceding, susceptible of living solitary or aggregated in a fixed manner, which would seem to make them composite animals, though they are not such; and he divides it into two tribes—1st, the simple Salpaceans (*Salpa*); 2, the aggregate Salpaceans (*Pyrosoma*). (1825.)

Chamisso, in his Memoir on *Salpa*, had previously (1819) taken, like Lamarck, the bilabiated aperture for that which corresponds to the mouth; but Cuvier, in his last edition of the 'Règne Animal' (1830), persists in his opinion as to the organization of these animals, which, according to him, move by making the water enter at the posterior extremity, and ejecting it by the anterior extremity, consequently going backwards; and all swim with the back downwards.

The following is Cuvier's description of *Salpa*; but we should premise that he places this genus in the first family of his *Acéphales sans coquilles* (the second order of his acephalous mollusks), and *Pyrosoma* in the second family (*Les Aggrégés*).

The *Biphores* (*Thalia*, Brown; *Salpa* et *Dagysa*, Gm.) have, says Cuvier, the mantle and its cartilaginous envelope oval or cylindrical, and open at both ends. On the side of the anus the aperture is transverse, wide, and furnished with a valvule, which permits the entrance but not the departure of the water; on the side of the mouth it is simply tubular. Muscular bands embrace the mantle and contract the body. The animal moves in making the water enter at the posterior aperture, which has the valvule, and in forcing it to go out by that on the side of the mouth, so that it is always pushed backwards, which caused many naturalists, Chamisso and others, to take the posterior aperture for the true mouth; but it is evident that it is no reason for changing the denominations of these parts because an animal swims on its back (which the *Biphores* generally do) with the head behind. Thus it was that the organization of the *Pterotracheæ* (which always swim with the back downwards, as is the case with an infinity of Gastropods with and without shells) was mistaken. The branchiæ form a single tube or riband furnished with regular vessels, placed scarfwise in the middle of the tubular cavity of the mantle, so that the water strikes it incessantly in traversing the cavity.* The heart, the viscera, and the liver are knotted into a nucleus (*pelotonnés*) near the mouth and on the side of the back; but the position of the ovary varies. The mantle and its envelope sparkle in the sun with iridescent colours, and are so transparent that one sees through them the anatomy of the animal; in many species they are provided with perforated tubercles. The animal has been sometimes seen to go out of its envelope without appearing to suffer. But one of the most curious phenomena attending the *Biphores* is that during a long time they remain united together, as if they were in the ovary, and thus swim in long chains, where the individuals are disposed in different orders, but always in the same order in each particular species. M. de Chamisso declares that he has proved a fact still more singular, namely that individuals which have thus come forth from a multiple ovary have not a similar one, but produce only isolated individuals differing in form, which in their turn yield ovaries similar to that from which their mother came forth, so that there is alternately a less numerous generation of isolated individuals, and a numerous generation of aggregated individuals. These alternate generations do not resemble each other. It is certain, continues Cuvier, that one observes in some species small individuals adhering in the interior of great ones by a sort of peculiar sucker, and of a different form from those which contain them. He adds that these animals are found abundantly in the Mediterranean and the warm parts of the ocean, and that they are often endowed with phosphorescence. (*Règne Animal.*)

M. Rang (1829) adopts the arrangement of M. de Blainville, but as provisional only, remarking that there is the greatest want of information with regard to the *Heterobranchiata*, and that it is most difficult to procure. He states that M. de Blainville is right when he says that neither the one nor the other aperture is the mouth or the anus, for, as Cuvier had demonstrated in his anatomical memoir on the *Biphores*, the mouth and the anus are very small apertures, hidden in the bottom of a vast canal which forms the envelope of the animal; for the rest M. Rang is of opinion that the term *anterior* should be applied to the extremity where the nucleus is found, and *posterior* to its opposite; he had remarked that the animal, which generally receives the water by the posterior aperture, can also take it in by the anterior opening. He admits the division proposed by M. de Blainville, because, although it is very true that the *Biphores* unite either in a linear or radiating direction, he has satisfied himself, after numerous observations, that this disposition only takes place when the animals are young. But it is not the same with *Pyrosoma;* the animals which that form comprises are probably aggregated throughout life. M. Rang arranges the following genera under this family :—

Simple Salpaceans.

Genera, *Salpa*, Cuv.; *Timoriensis*, Quoy et Gaim.; *Monophorus*, Quoy et Gaim.; *Phylliröe*, Péron et Lesu.

Aggregated Salpaceans.

Genus, *Pyrosoma*, Péron.

The circulation of the *Biphores* formerly observed by Kuhl and Van Hasselt, and since by MM. Quoy and Gaimard, appears to be very singular. The current is stated to change its direction periodically; and, according to the researches of M. Milne Edwards, referred to as ined the last edition of Lamarck (1840), the case is the with all the *Tunicata.*

Salpa.

M. de Blainville divides the genus into the following tions and subdivisions:—

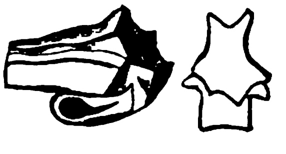
*

Species as it were truncated, without any prolo going beyond the apertures.

A.

Recurved species; the two terminal orifices ver approximated: aggregation?

Example, *Salpa polymorpha*, Quoy et Gaim.



Salpa polymorpha.

B.

Straight species; the orifices distant and term cartilaginous envelope consisting of three pieces; tion linear, oblique, two and two.

Example, *Salpa vaginata.* Length two inches.

Locality.—Straits of Sunda.

C.

Straight species: the orifices distant; the envelope single piece; aggregation circular.

Example, *Salpa pinnata.* The body is marked with dorsal lines, one yellow, the other white, and on each of the belly is a violet line. There is also a variety wi terrupted lateral lines.

Locality.—The Mediterranean Sea.

**

Body pointed at one or both extremities, arising fr prolongation reaching more or less beyond the a

D.

A prolongation at the anal extremity only; the ap of the side very small; aggregation? (Genus *Monop* Quoy et Gaim.)

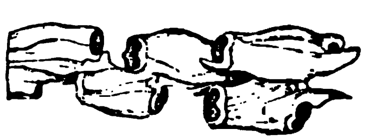
Example, *Salpa conica*, Quoy et Gaim. (*Vo* *l'Uranie*).

E.

A prolongation nearly of the same size at each ext mode of aggregation linear, oblique, two and two and three.

1. Prolongation to the left.

Example, *Salpa fusiformis.*



Salpa fusiformis.

2. Prolongation to the right.

Example, *Salpa Zonaria.* Sheath flesh-colour; yellow.

Locality.—The ocean near Antigua.

Salpa Zonaria.

F.

A prolongation at each extremity: the anterior muc longest and caudiform: aggregation? (Genus *Tim* Quoy et Gaim.)

Example, *Salpa firoloidea.*

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* Cuvier, in a note, says, 'Some authors state that the tube is pierced at the two ends, and that the water traverses it; a fact of which I have in vain sought to assure myself.'

Salpa firoloidea.

G.

Two prolongations, in the form of horns, at the posterior extremity only; aggregation?

Example, *Salpa bicornis*.

Locality.—Straits of Sunda.

H.

Three prolongations at the posterior extremity; aggregation?

Example, *Salpa tricuspidata*.

M. de Blainville adds, that though he has referred, almost without any doubt, *Salpæ conica* and *firoloïdea* to this group of animals, he ought not to conceal that MM. Quoy and Gaimard, to whom he owed the knowledge of them, think, even after his observations, that they ought to form two distinct genera, of which one will approximate the *Firolæ*, and that those zoologists had the advantage of direct observation; but he adds that unfortunately they did not bring home the animals themselves, and that it is only on figures and notes, incomplete perhaps, that these two genera are established.

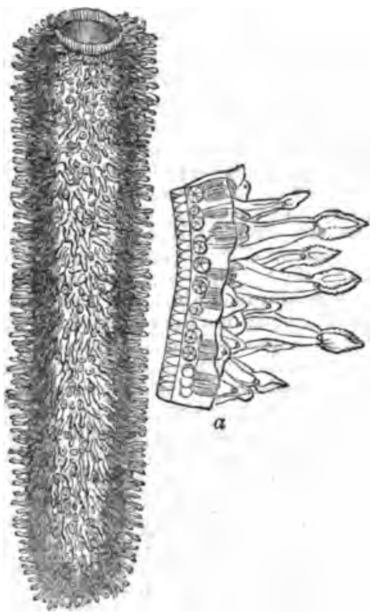
Pyrosoma.

Generic Character.—Animals elongated, fusiform, terminating in a point on one side and obtuse on the other, furnished with two apertures, one external, not terminal, the other internal and terminal, united among themselves towards their base by means of their external envelope, so as to compose numerous and regular rings, which concur to form a long free cylinder, rough with points externally, hollow and mammillated internally, and open at one extremity only. (Rang.)

Cuvier states that this great cylinder swims in the sea, y means of the combined contractions and dilatations of l the individual animals which compose it. The branchial ifices are pierced near the points, and the anus opens into e interior cavity of the tube. Thus, says Cuvier, one may mpare a Pyrosoma to a great number of stars of *Botrylli* OTRYLLUS] strung one after the other, but the whole of hich would be moveable.

Mr. George Bennett, in his interesting 'Wanderings in ew South Wales,' after some valuable remarks on the minosity of the ocean, proceeds as follows:—'On the h of June, being then in latitude 30′ south, and lontude 27° 5′ west, having fine weather and a fresh southsterly trade-wind, and the range of the thermometer being om 78° to 84°, late at night the mate of the watch came d called me to witness a very unusual appearance in the ater, which he, on first seeing, considered to be breakers. n arriving upon the deck, this was found to be a very road and extensive sheet of phosphorescence, extending in direction from east to west as far as the eye could reach; e luminosity was confined to the range of animals in this oal, for there was no similar light in any other direction. immediately cast the towing-net over the stern of the ip as we approached nearer the luminous streak, to ascerin the cause of this extraordinary and so limited a phenoenon. The ship soon cleaved through the brilliant mass, om which, by the disturbance, strong flashes of light were mitted; and the shoal (judging from the time the vessel ok in passing through the mass) may have been a mile breadth: the passage of the vessel through them ineased the light around to a far stronger degree, illumiating the ship. On taking in the towing-net, it was found filled with *Pyrosoma* (Atlanticum?), which shone with eautiful pale greenish light, and there were also a few mall fish in the net at the same time; after the mass had een passed through, the light was still seen astern until t became invisible in the distance, and the whole of the cean then became hidden in darkness as before this ook place. The scene was as novel as it was beautiful nd interesting, more so from having ascertained, by capuring the luminous animals, the cause of the phenomenon.

'The second was not exactly similar to the preceding; ut though also limited, was curious, as occurring in a high atitude during the winter season. It was on the 19th of ugust,* the weather dark and gloomy, with light breezes from north-north-east, in latitude 40° 30′ south, and longitude 138° 3′ east, being then distant about three hundred and sixty-eight miles from King's Island (at the western entrance of Bass's Straits). It was about 8 o'clock P.M. when the ship's wake was perceived to be luminous, and scintillations of the same light were also abundant around. As this was unusual, and had not been seen before, and it occasionally also appeared in larger or smaller detached masses giving out a high degree of brilliancy, to ascertain the cause, so unusual in high latitudes during the winter season, I threw the towing-net overboard, and in twenty minutes succeeding in capturing several *Pyrosoma* (pyrosomata), giving out their usual pale-green light; and it was, no doubt, detached groups of these animals that were the occasion of the light in question. The beautiful light given out by these molluscous animals soon subsided (being seen emitted from every part of their bodies), but by moving them about, it could be reproduced for some length of time after. As long as the luminosity of the ocean was visible (which continued most part of the night), a number of *Pyrosoma Atlanticum*, two species of *Phyllosoma*, an animal apparently allied to *Leptocephalus*, as well as several crustaceous animals, all of which I had before considered as intertropical species, were caught and preserved. At half-past ten P.M. the temperature of the atmosphere on deck was 52°, and that of the water 51½°. The luminosity of the water gradually decreased during the night, and towards morning was no longer seen, nor on any subsequent night. Vol. i.



Pyrosoma giganteum; *a*, a portion magnified.

In the museum of the Royal College of Surgeons in London (*Preparations of Nat. Hist. in spirit*) the following species will be found preserved:—

Lucidæ, MacLeay: compound and floating, having their branchial cavity open at the two extremities.

No. 119, C. *Pyrosoma Atlanticum*. This is well described in the catalogue as remarkable for the beauty and variety of the colours that are reflected when the animal is irritated.

Biphoridæ, MacLeay. Aggregated, in their young state, and floating.

Specimens of *Salpæ* are well shown from No. 119 D, to No. 128, both inclusive. Of these 119 D, *Salpa Confederata?* Forskahl; *Dagyza*, Banks; the Chain Dagyza; is thus described:—'In March, 1801, these Dagysæ were observed in the sea near Cape Finisterra; they were very near the surface, and formed chains several yards in length. From being subject to the undulations of the waves, they sometimes appeared to have a serpentine motion. When raised up out of the water, they readily separated. The bodies composing them were exactly similar, and lay parallel to each other; they exhibited a remarkable synchronous contractile movement, repeated about fifteen times in a minute; the action of contraction being rapid, that of relaxation slow and gradual. Their substance was a clear transparent jelly, enclosed in a very fine capsule: at one extremity was an opaque central spot or globule, of a dull red colour, from which lines appeared to radiate towards the circumference of the body.' (MS. note by John Howship, Esq.)

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* 'My journal,' says Mr. Bennett in a note, 'remarks the atmosphere to ave been very chilly during the day, but much milder in the evening; the ange of the thermometer during the day being from 49° to 56°

No. 124 presents a fine specimen of *Salpa Tilesii*. The cartilaginous protuberance covers the stomach and liver. Upon the protuberance are many cartilaginous spines; others may be observed scattered over different parts of the outer sac.

In 127, *Salpa maxima*, the outer tunic is laid open, and a bristle passed into the stomach.

In 128 (*Salpa maxima* also) the specimen is laid open, and the stomach, oblique intestine, and transverse muscular bands are more completely exposed. (*Cat.*, part iv., fasc. i.)

M. de Blainville is of opinion that *Pyura Molinæ* forms the passage between the simple and the aggregated Ascidians.

SALSETTE, an island in the Indian Ocean, close to the west coast of Hindustan, and included in the British presidency of Bombay and the province of Aurungabad. It is a little to the north of the island of Bombay, with which it is united by a causeway which was constructed in 1805. This causeway is very useful to the natives of Salsette, who bring vegetables and other produce by it to the Bombay market, but it is so narrow and inconvenient as to be rarely used by carriages. Salsette extends from 19° 4′ to 19° 17′ N. lat., and from 72° 50′ to 73° 2′ E. long., with an average length of about 16 miles and an average breadth of about 10; its area is therefore about 160 square miles.

The island consists for the most part of rocky hills, in some parts of considerable elevation, but covered with underwood to their tops; the jungle in many parts being very thick, while in the valleys there are groves of mangoes and palms, and some fine timber-trees. The tara-palm and cocoa-nut grow almost spontaneously among the jungle, but some care is bestowed on their cultivation, though little on anything else. There are tigers in the jungle, and great numbers of monkeys and jungle-fowl. The island is said to be fertile, and capable of much improvement, but little has been done for it by the British government, with the exception of an excellent road which has been made round it. Tannah and Gorabunder are the only towns. The latter is little better than a poor village, but Tannah is a neat and flourishing town on the eastern coast of the island, chiefly inhabited by descendants of Portuguese and by Hindus. The Portuguese are Roman Catholics, and have converted a great number of the Hindus, at the same time that they themselves have adopted most of the habits of the Hindus, and have become almost as dark-coloured. There is a small but regular fortress, and a considerable cantonment of British troops at Tannah. A wild race of people inhabit the hills, who are charcoal burners. They have no intercourse with the Hindus, who inhabit the lower grounds, but bring down their charcoal to particular spots, whence it is carried away by the Hindus, who deposit in its place a settled payment of rice, clothing, iron tools, or other necessaries.

The chief objects of curiosity in Salsette are the temple caves of Kennery, which resemble those of Elora, Elephanta, and Carlee. [Elora; Elephanta; Poonah.] They are numerous, but for the most part small, cut in two of the sides of a hill, at different heights, and of various forms. Some of the smaller ones seem as if they had been the residences of monks or hermits. The largest cave is a Buddhist temple, a rectangle about 50 feet long by 20 wide, terminated by a semicircle. The entrance is formed by a lofty portico, over which, but detached and a little to the left-hand, there is a high octagonal column, with three lions sculptured on the top, seated back to back. A colossal statue of Buddha, with his hands raised in supplication, is on the east side of the portico. A number of male and female figures, which seem to represent dancers, nearly naked, but not indecent, are carved above the screen which separates the vestibule from the temple. The temple is entered by a large door, above which are three windows contained in a semicircular arch. A colonnade of octagonal pillars surrounds the temple on every side except the entrance. In the centre of the semicircle a mass of rock has been left, cut in the form of a dome, with a sort of spreading ornament on the top like the capital of a column. The ceiling of the cave is a semicircular arch, curiously ornamented with slender ribs of teak-wood, of ceiling, which they seem to support, the case.

Salsette is supposed to contain about 50,000 in who are chiefly occupied in fishing, of whom al are of Portuguese origin. The Portuguese o session of the island in the 16th century; but from them by the Mahrattas in 1750, and conqu the Mahrattas by the British in 1774.

(Heber's *Narrative of a Journey through the vinces of India in* 1824 5.)

SA'LSOLA, a genus of plants of the n Chenopodiaceæ, so named from *salsus*, 'salt,' of many of the species yielding kelp and barilla. are chiefly found on the sea-shore in temperate world, and also in hot parts of the world whe saline or there is salt water in the vicinity. The characterised by having perfect flowers; the cleft, persistent, enveloping the fruit with crowning it with its enlarged scariose limb; styles two; embryo spiral; herbs or small shru pubescent; leaves alternate or opposite, roun flat; flowers axillary and sessile.

S. kali, so named from yielding barilla or kali, kali, is found on the coasts of Europe, and of the world, and is one of the species which is purpose of yielding kelp and barilla. S. found on the southern coast of Spain, whe taken to extend both it and the following sp vation, for the purpose of yielding barilla when crop is cut in September, and laid in small heaps These heaps are collected and burned, forty or fifty in a hole in the ground.

S. soda is found on the southern coast of Europe, the north of Africa.

Merat and Delens conceive that the species the soda of Alicant is a new species, and not ye which they propose calling S. beril. Other sp scribed by Forsköl as yielding soda on the Red Sea.

S. nudiflora Dr. Roxburgh describes as a native barren lands near the sea, where it is gathered for f but as the taste is strongly saline, it would no do good fossil alkali, and he gave it as his opinion tha with two Indian species of Salicornia, might be yield barilla sufficient to make soap and glass for world.

S. indica is another Indian species, growing in similar localities. The green leaves are eaten by the natives.

SALT. [Soda; Sodium; Manure.]

SALT TRADE. The principal part of the salt of England is made in the valley of the Weaver in Cheshire [Cheshire, vii., 43.] When the salt duty was repealed in 1824, there were seventy-five works where salt was mined in a fossil state: thirty-four were at Northwich, twenty-six at Winsford, three at Middlewich, and two at Nantwich, all in Cheshire; two were at Shirley Wich in Staffordshire; six at Droitwich in Gloucestershire; and two in Durham. There were at the same time thirty-five works at which salt was made by evaporation from sea-water, twenty-nine of which were in Hampshire and the Isle of Wight. In Scotland, at the same time, there were fifteen salt-works, and in all of them salt was made from sea-water. The rock-salt is used to strengthen the brine from salt-springs, from which the salt used for domestic purposes in England, and also a large portion of what is exported, is produced by evaporation. The Cheshire brine-springs are from twenty to forty yards in depth, and are very productive. [Cheshire.] The process of solar evaporation is now entirely disused. Nearly the whole of the salt exported is made in Cheshire, and is sent down the river Weaver, which communicates with the Mersey, to Liverpool. In the years 1832-3-4-5, the quantity of salt sent by the Weaver averaged 434,3[illegible] tons for each year. Mr. Porter states (*Progress of the Nation*, i. 346) that by adding 100,000 tons for the produce of other counties, and for that part of the Cheshire salt which is not sent to Liverpool, 'it is probable that the total produce of this mineral in England will be very nearly ascertained.' It may not therefore be far from the truth to estimate the annual production of salt in England at 500,000 tons. The sources of supply are said to be inexhaustible; and latterly the salt-manufacturers have so far extended their works, that the opening of new markets ould be of the greatest advantage to them. The Stafford-ire rock-salt is chiefly exported from Hull, and that of ucestershire from the port of Gloucester. The capital em-yed in the salt-manufacture is said to be about 1,000,000*l.*, nd the population engaged in it from 10,000 to 12,000.

A duty of 10*s.* per bushel was laid on salt in 1798, ch in 1805 was increased to 15*s.* In 1823 this duty was reduced to 2*s.*; and on the 5th January, 1825, was wholly repealed. The charge of collecting a gross reve- e of 1,496,387*l.* on salt, in 1821, was 33,879*l.*, or the moderate per centage of 2*l.* 5*s.* 3*d.* Salt used in the fish- es was duty-free, and in 1821 the quantity so used was 06,602 bushels; and about 150,000 bushels, required r bleachers, was also exempt from the duty. A duty only 5*s.*, which was afterwards reduced to 2*s.* 6*d.*, was rged on salt used for agricultural purposes. In the rs 1820-1-2, the net amount of revenue which the duty salt produced averaged 1,524,510*l.* annually. In the years from 1801 to 1808, the average annual con- ption of salt was 1,928,739 bushels; from 1810 to 1817 consumption averaged 2,060,495 bushels; and from 827 to 1834 it is computed by Mr. Porter, in the work lready quoted (p. 349), at 10,307,752 bushels. The annual onsumption of an adult is said to be 16 lbs. During the stence of the duty, the retail price was 4½*d.* per lb.: it is now ½*d.* The consumption is at present five or six times eater than it was at the beginning of the century. Salt now used more largely by the poor, and is employed in manufactures and in agriculture to an extent which is only ompatible with cheapness. From 1827 to 1830 inclusive, he annual exports of rock and white salt (the former for he use of salt-refiners, and the latter ready for immediate se) averaged 9,385,719 bushels; from 1831 to 1834 the xports averaged 10,814,545 bushels each year. The number of bushels exported in 1839 was 11,837,594, equivalent o 295,939 tons (declared value 218,907*l.*). The United States of America took 3,519,990 bushels; British North America, 1,668,839; Russia, 1,513,792; Belgium, 1,154,145; Prussia, 1,143,520; Holland, 799,166; Denmark, 693,960; western coast of Africa, 389,574; Germany, 283,242; and o various other parts smaller quantities were exported, in- luding 180,884 bushels to the Isle of Man and the Channel slands, and 137,254 to our Australian settlements.

The British government in India monopolises both the nufacture and sale of salt, and the exportation of British t to India is prohibited. Attempts have been made by e salt-manufacturers and ship-owners to obtain admission British salt into the ports of India at a moderate duty; nd the latter especially complain of the disadvantage of not eing allowed to take so convenient an article of merchan- ize to this part of our empire. The cost of production of finest Cheshire salt is about 3½*d.* or 4*d.* per bushel; and r paying all charges and freight to Calcutta, at the rate 20*s.* per ton, they state that the best salt could be laid own there at 1*s.* per bushel; and not unfrequently it would e taken out as ballast. The salt monopoly had existed in ndia long before the sway of the Company commenced; nd its modification and abolition are considered only as ons of time. In the years 1830-1-2-3-4, the gross evenue of the three presidencies averaged 2,184,415*l.* lly, and the net revenue 1,578,623*l.* It is believed a moderate duty on British salt would yield as large a evenue in the course of a few years, if the monopoly were bolished, while commerce would be benefited by the inter- nge of East India sugar and other native commodities British salt; smuggling in salt, which is extensively arried on, would cease; and in place of arbitrary and harsh strictions, the consumer would obtain a better article at cheaper rate. (*Report from Select Committee of the Commons on Salt, British India*, 1836.)

SALTA. [PLATA, LA.]

SALTASH. [CORNWALL.]

SALTCOATS, a town in Ayrshire, on the coast of the Frith of Clyde, 32 miles from Glasgow, partly in Ardrossan, partly in Stevenston parish. It was erected into a burgh barony by James V. in 1528, but it appears to have fallen nto such decay that in 1661 there were only four houses in he town. Early in the 18th century it began to revive hrough the exertions of Sir R. Cunningham, to whom the own belonged, who opened coal-works in the neighbourhood, cted large salt-pans, and made a harbour capable of ad- ting vessels of above 200 tons. The parish church of rossan is in Saltcoats: it is a tolerably large building, erected nearly seventy years since; there are also the Gaelic chapel, a neat building, of Gothic architecture; the town-hall, a moderate-sized building, of two stories, with handsome spire, clock, and bell; and the banking-house of the Ayrshire Banking Company. The population is estimated at about 4000, a considerable number of whom are sailors, colliers, and weavers. There were, in July, 1837, above 450 looms in the Ardrossan side of the town, chiefly kept in work by the Glasgow and Paisley manufacturers: they produced gauzes, shawls, trimmings, silks, &c. Many women were employed in sewing and flowering muslin. The salt-pans have been injured by the importation of English salt from Liverpool: magnesia is manufactured from the 'bittern or mother-water' of the pans. Some ship-building is carried on. The vessels that trade from the harbour amounted, in November i1837, to about thirty, of from 20 to 250 tons each: the aggregate tonnage was about 3000 tons, and the number of seamen employed about 180 The exports are coal, freestone, herrings, and earthenware chiefly to Ireland; and the imports, chiefly from Ireland, are oats, butter, and limestone. Some salmon and other fishing is carried on near the town, and several boats are yearly sent out to the herring fishery. There is a good market, and a yearly fair on the last Thursday in May There is a post-office, and communication is kept up by coach with Glasgow and Kilmarnock, and by steam-boats, either from Saltcoats or the adjacent harbour of Ardrossan, with Glasgow, Ayr, and Stranraer. The canal from Glasgow to Johnstone in Renfrewshire, and the connected railroad from Ardrossan to Johnstone, at present incomplete, contribute materially to benefit Saltcoats.

Besides the parish church of Ardrossan and the Gaelic chapel, there are three dissenting meeting-houses. The parochial school of Ardrossan parish is in the town, and there were, in 1837, a free-school for girls of both parishes, superintended by a committee of ladies, and about seven private schools. There are a subscription library and a Sabbath-school library; a public reading-room in the town-house; a parochial society for both parishes, for various purposes of religious benevolence; a 'benevolent society,' and a 'female benevolent society;' a female bible and missionary society, a savings' bank, and several benefit, or, as they are termed in Scotland, friendly societies.

(*New Statistical Account of Scotland.*)

SALTFLEET. [LINCOLNSHIRE.]

SALTILLO. [MEXICAN STATES.]

SALTPETRE. [POTASSIUM.]

SALTS. The term salt, originally restricted in its application to common salt, which it still means when used merely by itself, is now applied to a vast number of substances which have in many cases few properties in common.

Common salt is the principal of a class composed of a metal and such bodies as chlorine, iodine, bromine, and fluorine, and the radicals of the hydracids, and which are included by Berzelius in his class of *haloid-salts* (from ἅλς, sea-salt, and εἶδος, form), because in constitution they are analogous to sea-salt. The whole series of the metallic chlorides, iodides, bromides, and fluorides, such as chloride of sodium, iodide of potassium, and fluor-spar, are, as well as the cyanides, sulphocyanides, and ferrocyanides (though the three last are very differently constituted from the former), included by Berzelius in his list of haloid-salts.

It was for many years admitted as an unquestionable fact that common salt was a compound of muriatic acid and of soda; and hence it was very commonly called muriate of soda. But it has been shown by Davy, that the acid and alkali during their action on each other suffer mutual decomposition; and that while water is formed by the union of the hydrogen of the acid with the oxygen of the alkali, the chlorine of the former and the sodium of the latter unite to form chloride of sodium. It has since been proved that this occurs with all what are called *hydracids*, when they act upon metallic oxides: thus while hydrochloric acid and soda give chloride of sodium and water, hydriodic acid and soda yield iodide of sodium and water, and hydrocyanic acid, cyanide of sodium and water, &c.

While then the hydracids, by the decomposition which they suffer, do not yield *hydro-salts* with the metallic oxides, yet hydro-salts may be formed by saturating these acids with the vegetable alkalis; for example, hydrochloric and hydriodic acids yield respectively hydrochlorate and hydriodate of quina, when made to act upon this base. With ammonia hydrochloric acid forms the salt called sal-ammoniac; but it is questioned whether this is not analogous to the chlorides, chloride of ammonium being formed by the conversion of the ammonia into ammonium, by the transference of the hydrogen of the hydrochloric acid to the ammonia, which is theoretically supposed to consist of one equivalent of azote and four equivalents of hydrogen, instead of one equivalent of azote and three equivalents of hydrogen, which exist in ammonia.

The *Oxy-salts* form another numerous and important class of compounds: these are formed when an oxacid is made to combine with an oxidized base; as, for example, when sulphuric acid unites with soda, the result being sulphate of soda. The sulphates of potash, lime, magnesia, &c. are similarly constituted; but a question has lately arisen whether these salts are not also analogous to the chlorides, in containing a metal rather than an oxide; thus, instead of supposing that sulphuric acid, composed of one equivalent of sulphur, and three equivalents of oxygen, is combined with soda formed of one equivalent each of sodium and oxygen, it has been, and with some plausibility, supposed that the oxygen is transferred to the sulphuric acid, forming a compound which has never yet been isolated, consisting of one equivalent of sulphur and four equivalents of oxygen, and that this is combined with sodium. Professor Daniell has proposed the same of *oxysulphion* of sodium for such compound, while Professor Graham denominates it a *sulphat-oxide* composed of *sulphat-oxygen* and sodium.

Another class of bodies has been described by Berzelius as coming within the description of salts; namely, the sulphur-salts. In this country however they generally are classed together as double sulphurets; thus, according to Berzelius, the well-known copper pyrites, or double sulphuret of iron and copper, is a sulphur-salt. Electro-positive sulphurets, termed *sulphur-bases*, are usually the protosulphurets of electro-positive metals, and therefore correspond to the alkaline bases of those metals; and the electro-negative sulphurets, *sulphur-acids*, are the sulphurets of the electro-negative metals, and are proportional in composition to the acids which the same metals form with oxygen. Hence, if the sulphur of a sulphur-salt were replaced by an equivalent quantity of oxygen, an oxy-salt would result.

In general properties the various classes of salts, and indeed the individuals of the same class, differ as widely as possible; some are crystallizable, others uncrystallizable; they are colourless, and of various colours; sapid and insipid; soluble and insoluble in water, alcohol, and other menstrua; volatile and fixed in the fire; decomposable or undecomposable by the same reagent. Such salts as decompose each other when brought into contact are called incompatible salts.

Salts have been conveniently, though not quite correctly, divided into alkaline, earthy, and metallic salts; for strictly speaking most of the two former belong to the latter, and to these classes must be added the ammoniacal salts and the salts of the vegetable alkalis. Again, salts constituted of the same elements may contain one or other in excess; thus soda and various other bases combine with three different portions of carbonic acid. The first is the neutral carbonate, containing one equivalent each of acid and of base; the second contains one-half more carbonic acid, and is called the sesqui-carbonate; and the third contains twice as much carbonic acid as the first, and is the bi-carbonate.

Super-salts are such as contain an excess of chlorine or of acids, and sub-salts such as contain excess of base. Dr. Thomson has proposed, and it is very conveniently adopted in practice, to describe the degree of excess of acid in the super-salt by Latin terms, and that of the excess of base by Greek: thus while a compound of two equivalents of chlorine and one of a base, or of an acid and base, is called a bi-chloride or bi-sulphate, as the case may be; a compound containing one equivalent of chlorine or acid to two of base, is termed a *di-chloride*, &c.

SALUZZO, a province of the Sardinian states, is bounded on the north by the provinces of Pignerol and Turin, east by the provinces of Alba and Mondovi, south by the province of Cuneo, and west by the chain of the Cottian and Maritime Alps, which divides it from France. The western part of the province stretches along the eastern slope of the Alps, forming several transverse valleys, through which flow the Po, the Vraita, the Maira, and some minor streams, all of which at first run eastwards, but after emerging from the highlands, turn to the north and flow [illegible] fertile plain which opens between the [illegible] Alps and the hills of Monferrato, where t[illegible] Po above the town of Carignano. [Po, B[illegible] plain, which belongs partly to the province o[illegible] partly to those of Alba and Turin, abounds [illegible] pulse, fruit, hemp, and rich pasture, [illegible] canals. The rearing of silkworms is [illegible] branch of industry. The mountains are [illegible] nut trees, which supply food to a great part [illegible] try. The population of the province of Sal[illegible] to about 136,000, distributed in 52 c[illegible]

The principal towns are,—1, Saluzzo, [illegible] a considerable town, built on the slope of a [illegible] one of the lowest projections of the [illegible] up of [illegible] it has an old castle, once the residence [illegible] the Saluzzo, a sovereign house of the midd[illegible] cathedral, several other fine churches, a roy[illegible] pital, and about 10,000 inhabitants, who c[illegible] able trade in the products of the soil, and [illegible] factures of silk, leather, hats, linen, and iron. 2[illegible] a town of 15,000 inhabitants, 10 miles east of [illegible] the banks of the Maira, on the road from Tu[illegible] and in the middle of the fine plain above [illegible] some good streets, a fine market-place, [illegible] several other churches adorned with painti[illegible] a native of the place, two hospitals, and ma[illegible] cloth, and linen. Many of the provincial [illegible] proprietors have their residence at Sa[illegible] conigi, six miles north of Savigliano, [illegible] 10,000 inhabitants, situated in a very frui[illegible] garden of Piedmont, is just above the c[illegible] Grana and the Maira; it has a handsome co[illegible] of the princes of Carignano. 4, Dronero, [illegible] the Maira, a busy town on the mountain-ro[illegible] across the Alps to Barcellonette in France. 5, [illegible] small town which gives the title of count to a [illegible] family of Piedmont. 6, Barga, in the uppe[illegible] Po, a town with 7000 inhabitants.

(Serristori; Neigebaur; Denina, *Tableau* [illegible] *et Statistique de la Haute Italie.*)

SALVADO'R, SAN, the capital of the [illegible] and until lately the seat of the federal [illegible] United States of Central America, is si[illegible] lat. and 89° 10′ W. long. The town is built [illegible] ground, in a kind of valley, surrounded by h[illegible] with wood, among which, in a north-easte[illegible] at a distance of about nine or ten miles, [illegible] S. Salvador, which at different periods [illegible] devastation by its eruptions. The Rio de A[illegible] river, rises about seven miles south of the t[illegible] the south of it, and falls into the river L[illegible] posed that the site of the town is more tha[illegible] the level of the sea. Accordingly it enjoys a very [illegible] climate, which however is warm enough [illegible] the [illegible] tion of sugar, the plantations of which [illegible] vicinity of the town with extensive orcha[illegible] itself is laid out with considerable r[illegible] crossing each other at right angles, e[illegible] where this plan has not been strictly ad[illegible] pavement is very bad. The houses are [illegible] mostly of a ground-floor. In the centre o[illegible] plaza, or square, three sides of which a[illegible] shops, with porticos before them, supported by a [illegible] nade. On the fourth side is the cathedral, a[illegible] which has no great claims to architectural be[illegible] population is about 16,000. There are [illegible] of iron, especially of cutlery, and the [illegible] are highly prized all over Central A[illegible] cotton-stuffs are also made here. [illegible] families is not great, and the mestizoes, o[illegible] are called here, constitute the bulk of the p[illegible] commerce is not great. Some sugar and [illegible] to Acajutla and to Puerto de la Libert[illegible] spectively 50 and 30 miles distant from [illegible] vicinity there are some warm and some cold [illegible] which afterwards unite, and thus afford to the [illegible] the advantage of having natural baths of every [illegible] temperature.

(Juarros, *History of the Kingdom of* [illegible] kens, *Reize naar Guatemala*; Haefkens' [illegible] and Montgomery's *Narrative of a Jo*[illegible]

SALVADOR, SAN, DE BAYA [illegible]

island of Cuba, in the eastern Intendencia, in 20° 40′ N. lat. and 76° 55′ W. long. It is built in a hilly country, which supplies excellent pasture for cattle, and contains some plantations of sugar and coffee. The population amounts to 7500, among whom there are about 1500 slaves and 20 free people of colour. The produce of the country s brought to this town from a considerable distance, and ce sent to the harbour of Manzanillo, where it is shipped. (Humboldt's *Voyage aux Régions Equinoxiales du Nouveau Continent.*)

SALVADOR, SAN, DE BAHI'A, commonly called *ahia*, a city of Brazil, the most commercial town in South merica, and also the largest and most populous, next Rio de Janeiro, is situated in 13° S. lat. and 38° 40′ W. long. It is built on the eastern shores of the strait hich leads from the Atlantic to the Bahia de Todos os antos, or All Saints' Bay, and this strait constitutes its arbour.

The Bahia de Todos os Santos extends, from south to orth, about 33 miles, from Cape S. Antonio to the mouth the river Sergipe, and is about 28 miles across in the idest part. Its opening is to the south, and in this ening there is an island, called Itaparica, which is about miles long and 6 miles broad. Of the two entrances rmed by this island, the western, called Barra Falsa, hich is only two miles wide at the narrowest part, has me shoals, especially at its southern extremity, which event even vessels of moderate size from entering the y. Large vessels pass through the eastern entrance, hich is hardly more than four miles wide, and has only fficient depth for men-of-war along the eastern shores, there are some rocky shoals in the middle of the enance, and at the distance of half a mile from the island Itaparica there is a reef which is covered with water. the interior of the bay other shoals are met with, pecially between the northern point of the island of aparica and the Ilha dos Frades, which lies north of it, d between the last-mentioned island and the mouth of e rivers Sergipe and Paraguassú, the two largest rivers hich fall into the bay. By these shoals the greatest rt of the bay is rendered unfit for receiving large ssels, but there is water enough on them for the country ssels which bring the produce of Reconcavo [BAHIA] the town of S. Salvador. The common anchorage gins at the distance of from three to four miles from e S. Antonio, the most southern point of the peninsula which separates the bay from the Atlantic. Where anchorage begins, and opposite to the southern extremity of the town, is the Forte de S. Marcello, commonly lled Fortim do Mar, on a small rocky islet. Larger vessels nerally anchor west of this fortress, but those which quire less depth anchor farther north, between the Fortim Mar and the Forte de S. Felipe, which is built on a projecting point, the Punta de Monserrate, about four miles ther north. These two fortresses protect the anchorage. orth of the Punta de Monserrate the land retires and ms a small bay called Tagagipe, the entrance of which protected by the Forte de S. Bartholomeo, and which ves as a dock-yard for the construction of merchant ssels.

Opposite the anchorage lies the city, which consists of o towns, the Citade Baixa, or Praya, and the Citade Alta. e Praya (beach) is a strip of low land, so narrow as to mit only of a single street, except in the middle, where e short streets branch off eastward. It is the seat of commercial activity, where the large warehouses, called *trapiches*, e situated, in which both imported goods and those which e destined for exportation are deposited. Here also are numerous workshops of the jewellers, who work in gold silver, and set the precious stones that are brought the Minas Novas. This is almost the only branch of ufacturing industry in Bahia. The town is meanly t and dirty. Among the buildings the Exchange and e church of Nossa Senhora da Conceição are distinguished their architecture. The church is a fine edifice, with a ont of European stone, and is richly decorated within. At southern extremity of the Praya is the royal dock-yard the arsenal, but the dock-yard is not spacious, and only few vessels can be built at the same time. At the back f the Praya rises a hill with a steep ascent. Some parts f the declivity are covered with buildings, but the steeper are planted with bananas and orange-trees. The streets ich lead across this ascent to the Citade Alta are paved with bricks, and are almost impassable for carriages. People who can afford it are taken to the Citade Alta in sedan-chairs carried by two negroes.

On the top of the hill stands the Citade Alta, on an undulating and in some parts hilly surface, from 100 to 300 feet above the sea-level. Most of the streets are wide and straight; and the houses, being built of stone, and from two to five stories high, exhibit in their exterior a certain degree of taste, but are destitute of comfort within. The centre of the town lies in a depression, and contains the best streets, and several squares, among which is Praça da Parada, where the palace of the governor, the town-hall, the mint, and the edifice of the supreme court (Relação) are situated. The most remarkable building in this part of Bahia, and indeed in all Brazil, is the College of the Jesuits, with the contiguous church, which is now used as the cathedral. Europe and the East Indies have contributed to ornament this church. Some fine pictures, the brass ornaments embellishing the choir, the gildings of the altar, and an excellent organ, were sent from Europe; and the beautiful and splendid wainscoting of the vestry, made of choice pieces of tortoise-shell, was brought from the East Indies. The college contains a public library, which consists of a small portion of that collected by the Jesuits, but has been increased by a considerable number of modern books. It contains more than 12,000 volumes. The greater part of the building is however appropriated to a military hospital. The other churches, more than thirty in number, are not remarkable, except that of the Italian Capuzins, which has lately been erected, and has a fine cupola. Other remarkable public buildings are the city hospital (Caza de Misericordia), the school of surgery, the house for white orphans, and the palace of the archbishop. Within the circuit of the town there is a considerable number of extensive gardens and orchards, whose plantations of orange-trees greatly contribute to render this place a pleasant residence. At the south-eastern extremity of the Citade Alta is the *Passeio Publico*, or public walk, on one of the most elevated eminences of the town, from the pavilion of which the whole bay, with its green island, and the Atlantic Ocean, can be seen. The alleys are planted with rows of trees introduced from Europe and the East Indies, and the intermediate places are embellished with flowers transplanted there from various parts of Brazil, Southern Europe, and Southern Asia. Contiguous to the Passeio Publico is the Forte de Santo Pedro, the most important fortification of the town, which protects it against attacks on the land side. It existed before the town was taken by the Dutch (1624), but was much enlarged and improved by them; and they intended to make a wide moat from the fortress to the sea, but this plan has only been executed in part. The Dique, as this moat is called, is built of bricks, and extends through a considerable space along the eastern extremity of the suburb Barril, between gentle eminences and pleasant bushes and woods. Caimans are frequently seen in the moat. At the north-eastern extremity of the town is the Forte Barbalho, which defends the great road that leads from the town northward to the interior of the province.

The population of Bahia is stated to exceed 180,000, and is fast increasing. The negroes probably form nearly two-thirds of it, and about nine-tenths of the negroes are slaves. The number of inhabitants belonging to the mixed races is also considerable. It is not easy to determine the number of whites, as many of the inhabitants claim a place among them, though their complexion and features do not support their claim. The great disproportion between the negroes and the other population is the principal cause of the outbreaks by which in recent times the peace of the inhabitants has been disturbed.

Bahia contains a college, in which Greek, Latin, mathematics, logic, metaphysics, and rhetoric are taught by eight professors. There are also other schools in which some branches of knowledge are taught by persons who have not taken orders; but they are under the superintendence of the clergy. Persons destined for the church receive the requisite instruction in a seminary under the direction of the archbishop. Those who wish to study the law generally go to Coimbra in Portugal, and the students of medicine to Paris or other parts of Europe.

Bahia has great advantages over Rio de Janeiro in a commercial point of view. Rio de Janeiro is separated from the interior provinces by three ranges of high mountains, each consisting of several ridges, all of which have such steep declivities that it is hardly possible to make roads over them on which carriages can be used. The expenses of transport for heavy goods are therefore very great, and most of them cannot reach a market. But from Bahia the country towards the interior does not rise by steep ranges, but by long slopes and wide terraces, and in these parts there are no obstacles to making roads. The state of the country and the population have not been such that their want is yet felt, but these advantages are so obvious, that the cotton of Minas Geraes and of Goyaz is already brought to Bahia, even from places which are nearer to Rio Janeiro than to Bahia. Three roads lead from Bahia to the interior. The most northern goes to the Sertão de Pernambuco and the province of Piauhy, traversing Cachoeira, Jacobina, or Villa Nova da Ruinha, and Joazeiro; the last-mentioned town stands on the banks of the Rio de Santo Francisco. The central road goes to Goyaz and Matto Grosso, beginning at Cachoeira, and passing through the towns of Cincora and Villa do Rio de Contas and Caytete to Carynhanha on the banks of the Rio de Santo Francisco, whence it passes into the southern districts of Goyaz. The most southern road begins at Jaguaripe, opposite the island of Itaparica, and passes thence in a south-western direction to Conquista and Rio Pardo, whence it traverses the Serra do Gram Mogul, and enters that portion of Minas Geraes which is called Minas Novas, where the cultivation of cotton is rapidly increasing. By these roads the foreign goods which are consumed in the interior of Brazil reach the places of consumption, and the produce of the country is brought to market. But only a very small portion of the goods exported from Bahia is brought to the place of embarkation from the interior. By far the larger part is collected in the Reconcavo [BAHIA, vol. iii., 279]; but considerable additions are also made to the exports from the countries north of Cape Santo Antonio, as far as the mouth of the Rio de Santo Francisco, and even the town of Maceyo in Alagoas. The provinces of Sergipe and Alagoas, having no harbours which admit large vessels, send their sugar and cotton to Bahia. The coast south of Bahia, as far as Porto Seguro, has also no harbours for large vessels, with the exception of that of Camamú, which however is not used on account of its vicinity to Bahia. Thus the countries adjacent to this coast must likewise send their produce to Bahia; but it is not of such a description as to add much to the exports of Bahia, as it consists chiefly of provisions that are consumed in the town. The rice exported from Bahia is brought from these parts.

The goods collected for exportation from all these countries consist of sugar, cotton, tobacco, hides, rice, and coffee; also of rum, molasses, train-oil, tallow, hides, horns, fustic, braziletto, and small quantities of ipecacuanha, cacao, ginger, indigo, and isinglass. The largest articles are sugar and cotton. The production of sugar has rapidly increased. In 1817 it amounted to 27,300 cases, and in the following year to 29,575. About eight years ago it was estimated at 50,000 cases, and last year (1840) the exportation of this article alone was between 60,000 and 70,000 cases. Each case weighs about 1200 lbs. Thus the present exportation of sugar is between 72 and 84 millions of pounds. The largest quantity, about 36,000 cases, goes to Germany, 22,000 cases through Hamburg, and 14,000 cases through Trieste, and between 12,000 and 15,000 cases go to Lisbon and Oporto. Smaller quantities are taken to France, Italy, and other countries of Europe. The most important article next to sugar is cotton, of which more than 50,000 bags are exported, nearly the whole of which goes to Liverpool; a small quantity goes to Bordeaux. The tobacco, amounting to between 300,000 and 400,000 arobas, goes mostly to Portugal, the Mediterranean, Hamburg, and Africa. The hides, between 80,000 and 100,000 pieces, are sent to Portugal, Amsterdam, Antwerp, the Mediterranean, and the United States of North America. Rice, about 100,000 arobas, is only exported to Portugal. Coffee, amounting to 20,000 arobas, is mostly sent to Hamburg. Bahia carries on an active commerce with the province of Rio Grande do Sul, and with Monte Video and Buenos Ayres: it receives from these places chiefly jerked beef, which is the common food of the slaves, and sends in return sugar, coffee, tobacco, and cacao. Tobacco is also sent to Rio Janeiro. The exports are said to amount in value to 2,000,000*l.*

The imports amount nearly to the same sum. Those brought from England consist of different kinds of cotton fabrics, woollen stuffs and cloth, linen, brass and copper ware, china and earthenware, iron and steel, wrought [illegible] ware and cutlery, tin, hats, ropes, arms [illegible] ter and cheese, porter, soap and candles. [illegible] are sent to Bahia from the British [illegible] rica. France sends from Nantes and Bordeaux [illegible] of fashion, furniture, hats, dry fruits, wine, [illegible] From Holland and Belgium are brought beer, [illegible] linen, geneva, and paper; from Germany, glass, and brass utensils; from Russia and Sweden, iron [illegible] utensils, sail-cloth, cords, ropes, and tar; [illegible] wine, brandy, fruits, hats, and European [illegible] from the United States, wheat, flour, biscuits, [illegible] pitch, potashes, and some articles of rough [illegible] coarse cotton-cloth. From the Cape Verde I[illegible] ported sulphur, gum-arabic, and salt.

The number of vessels annually entering the [illegible] Bahia with cargoes, amounted, in 1803, only to [illegible] but now they exceed two hundred, and probal[illegible] dred and fifty. Many vessels bound to [illegible] resort to this place to get water and fresh pro[illegible]

The bay was discovered in 1503 by [illegible] and received from him the name of [illegible] Santos. The town was built in 1549 by [illegible] It was taken by the Dutch in 1624, but in the [illegible] was retaken by the Portuguese. In 1638, the [illegible] the command of Prince Maurice of Nassau, [illegible] but were not able to take it. [illegible]en the [illegible] Brazil was declared in 1822, the Por[illegible] refused to surrender Bahia, and [illegible] Brazilian troops, after a long siege, on the [illegible] 1823. Since that time the peace has frequently [illegible] turbed by insurrections among the slaves, which [illegible] much bloodshed and even to civil war.

(Lindley's *Narrative of a Voyage to Brazil;* [illegible] son's *History of Brazil*; Spix and Martius, *Reis*[illegible]*zilien.*)

SALVADO'RA, a genus of plants which [illegible] in different families, but usually in Chenopod[illegible] attaches it to Plumbagineæ, but under the [illegible]doraceæ. The species are few in n[illegible] warm and dry parts of the world, [illegible] Arabia, and on the coasts of the Mediterranean, [illegible] extend along the north of Africa, from [illegible] N[illegible]gambia. The genus is characterised by hav[illegible] leaved calyx; corol united into a single pie[illegible] membranaceous; stamens four, perigynous, [illegible] lobes of the corol; anthers subglobular, two-[illegible] inwards and vertically; ovary free, one-celle[illegible] erect from the base, anatropous; sti[illegible] berry single-seeded, seed erect; cot[illegible] convex peltate, including the inferior [illegible] smooth, and have a hoary and glaucous [illegible] stem is jointed, the leaves opposite, stalk[illegible] thery, obscurely veined; flowers minute, lo[illegible] small branches of S. indica, being cut and [illegible] used by the natives of India for cleani[illegible] leaves of this species, being purgative, [illegible] The bark of S. persica is acrid, and raise[illegible] tion is considered tonic, and the berries are [illegible]

SALVADORA'CEÆ, a natural or[illegible] Exogens, comprising only one genus, [illegible] characterised by possessing a superior ova[illegible] single carpel, single style with a simple [illegible] celled fruit with a single seed. The posi[illegible] Salvadora has always been doubtful: by [illegible] been referred to Chenopodiaceæ, alth[illegible] it has [illegible] petalous corolla; by others it is r[illegible] from which it differs in the position of its [illegible] structure of the ovary and seeds. It [illegible] to Plumbaginaceæ and Plantaginac[illegible] agrees in habit, and with the lat[illegible] the parts of the flower, its membranous coro[illegible] style. They are Indian and North African [illegible] eatable fruit.

SALVAGE. [SHIPPING.]

SALVATOR. [SAUVEGARDE.]

SALVATOR ROSA. [ROSA, SALV[illegible]

SA'LVIA (perhaps from *salvus*, [illegible] plants belonging to the natural order L[illegible] It belongs to the Monopetalous division o[illegible] and is known by its 2-lipped tub[illegible] or bilabiate corolla, with the upper [illegible] mens with halved anthers, having [illegible]

s placed vertically with the anther on the upper end.
ecies of this genus are well known both as orna-
shrubs and on account of their uses in domestic eco-
The best known and that which is used most fre-
in this country is the *Salvia officinalis*, the garden
It is a native of various parts of the south of Europe.
low straggling shrub, with erect branches, hoary
wn, leafy at the base; entire, stalked, oblong, nar-
at the base or rounded leaves; nearly simple ra-
many-flowered distinct whorls; campanulate, co-
membranous calyx; corolla two or three times as
the calyx, with a large projecting tube ringed inside,
erect, the upper lip straight, the lateral lobes of
er one reflexed. This plant is much used in cookery,
supposed to assist the stomach in digesting fat and
foods. Sage-tea is also commended as a stomachic
ht stimulant. It is said that the Chinese prefer an
of sage-leaves to that of their own tea, and that the
once carried on a profitable traffic by carrying sage-
o China, and bringing back four times the weight of
es.

a pomifera, apple-bearing sage: leaves crenate,
articulated with veins, lanceolate; heart-shaped at
e; calyx 3-lobed, bluntish. It is a native of rough
lls in Crete and various parts of the Levant. It is
ble for being liable to the attacks of an insect of the
genus, which produces upon their branches little
rances similar to galls upon the oak, but much
These morbid growths contain an acid aromatic
nd on this account are valued by the inhabitants of
an article of diet.

a sclarea, common clary: leaves oblong heart-
rugged, villous, doubly crenate; bracteæ coloured,
, longer than the calyx. This plant is a native of
yria, and Bithynia, and is one of the longest known
xotic herbs found in British gardens. It is some-
ed for making wine, which has a taste resembling that
tignac, and is remarkable for its narcotic qualities.

lendens, *Indica*, *formosa*, and *fulgens* are all hand-
namental flowers, and as such are much cultivated.
plants of this genus are raised without much diffi-
nd the most tender will live through the winter
a wall, and flower beautifully all summer. *S.*
ryoides is a dwarf species, which is frequently found
ns with flowers of an intensely brilliant blue.

atensis, meadow clary, and *S. verbenacea*, wild
clary, are natives of Great Britain.

VIA'TI, IL, FRANCESCO ROSSI, so called from
been patronised and protected by the Cardinal Sal-
is the son of Michel Angiolo Rossi, and was born at
e in the year 1510. He studied painting first under
del Sarto, and afterwards under Baccio Bandinelli,
fellow-student with Giorgio Vasari, between whom
nself there existed a strict intimacy. They studied
r at Rome, and although the superior genius of Sal-
ompted him to a higher class of design than that to
asari attained, the latter, with a remarkable freedom
alousy, always in his writings celebrated the emi-
f his friend. Indeed in his 'Le Vite di più excel-
ttori,' he speaks of the work of his fellow-pupil and
man in the Palazzo Grimaldi at Venice, representing
ory of Psyche, as the finest work in Venice. Whilst
e Salviati painted the Annunciation and Christ ap-
to St. Peter in the Church of La Pace, and he embel-
he vault of the chapel of his patron the cardinal
series of frescoes representing the life of St. John
tist; he painted for the Prince Farnese a set of car-
r the tapestry of his palace, displaying the principal
of the history of Alexander the Great, and, in con-
with Vasari, he ornamented the Cancellaria with
fresco works.

Rome he went to Venice, and from thence to
and Florence, and in the latter city was employed
grand-duke to decorate one of the saloons of the
Vecchio, where he painted the Victory and Triumph
us Camillus. He did not long remain at Florence,
on the invitation of the Cardinal de Lorraine, visited
where he painted for Francis I. some part of the
of Fontainebleau. In Paris he executed a fine work
church of the Celestines, representing the Taking
rom the Cross; but not feeling satisfied with his
n in the dominions of Francis, he returned to Rome,
e died, in the year 1563.

The violence and turbulence of Salviati's disposition caused him to be frequently embroiled in quarrels, and his envious and illiberal disposition towards the merits of his brother artists provoked from them a comparison of his works with those of others, as uncalled for as unjust. Though received in France by Primaticcio, the superintendent of the works at Fontainebleau, with distinguished respect and much personal kindness, he acted towards that person with ingratitude; and when he returned to Rome, he fell into virulent disputes with Daniello di Volterra, Pietro Legorio, and others; and carried his violence to such excess that it is said to have brought on a fever, which proved fatal to him.

In invention Salviati was rich and fertile; in composition, original and copious; and though his colouring is not so highly esteemed as his strict correctness of design, his carnations are delicate and tender. He showed great skill in the management of his draperies, which are broad and simple, and yet do not conceal the beauty of his forms, whilst in the representation of architectural accessories he possessed a magnificent conception and a masterly style of handling, and was scrupulously exact in the delineation of the antient Roman costume. His pencil appears to possess more the spirit of Bandinelli than of Del Sarto, with the exception of the Descent from the Cross, in the Celestines in Paris, which strongly partakes of the style of the latter artist. (Pilkington's and Bryan's *Dictionaries*.)

SALVINIA'CEÆ, a small natural order of Acrogenous or flowerless plants. They possess rooting and floating stems; leaves sessile, entire, somewhat ovate, imbricated; receptacles globose, on the same individual of two forms, attached to the stem near the base of the leaves and the roots, closed, valveless, some filled with angular capsules confusedly enclosed, and by some taken for anthers; others one-celled, comprehending numerous small-staked many-spored bags inserted on a central column or on a tubercle of the base. This order comprises only two genera, Salvinia and Azolla. They are related in structure both to the Ferns and Mosses, and their nearest affinities are with Marsileaceæ and Polypodiaceæ; from the latter however they differ in having their conceptacles of two kinds, and from the latter by their being indehiscent. Azolla is a New Holland plant; Salvinia is common in the south of Europe.

SALZBURG, formerly the duchy of Salzburg, is now the circle of Salzburg, or of Salzach, in Upper Austria. It is bounded on the north and north-east by the circle of the Inn, on the east by the circles of the Hausrück and Traun, on the south-east by Styria (Steyermark), on the south by Illyria, and on the west by Tyrol and Bavaria. The area is not above 2800 square miles, since the cession of part of the country to Bavaria, and the population is about 145,000. It is an Alpine country, like Switzerland and North Tyrol, and it is covered by the Noric Alps, which on its southern frontier branch out from the Rhætian Alps. It may be considered as consisting of one great valley, the valley of the Salza, from its source to the point where it leaves the mountains, and of numerous lateral valleys, which open into it, most of which are traversed by rapid torrents. 'The principal valley, one of the most lovely,' says Hassel, 'that has been formed by nature, and adorned by the industry and magnificence of man, begins in the western corner of the country, runs first to the east, then to the north, and, especially on the right side, along the southern frontier, is enclosed by lofty mountains, the continuation of the central Alpine chain, which passing through Tyrol, to the eastern frontier of Salzburg, forms an almost uninterrupted chain of glaciers, here called Kees, presenting all the varieties of Swiss scenery, defiles, avalanches, cascades, lakes, &c.' Some of these mountains are covered with eternal snow. The chain of calcareous rocks which accompanies the central Alps to the north forms the frontier on the other sides, and its highest points are 8382 feet above the level of the sea. The country is open to the north only where the Salza issues from the mountains, and forms a fruitful plain, which however is marshy in some parts. The principal rivers are the Salza, the Saale, the Ens, and the Mur. The lakes are numerous; that called the Zellersee is ten miles long and above two broad. Of the many mineral waters, the hot springs of Gastein are the most celebrated. The cascade of the Krimonler Ache (which is the name of mountain-torrents in the language of the country) is the most striking in Austria; the torrent falls in five breaks from the height of above two thousand feet, forming at last a magnificent arch. There are other very fine cascades. The climate is much more severe than we should expect in a country situated between 46° 50′ and 48° N. lat. Even in the neighbourhood of Salzburg the hills, which are much lower than those of the south, are covered with snow by the end of September, though it does not lie permanently till November. In the south the winter lasts, with little intermission, from the beginning of November till April, and storms and frosts do not cease till the end of June. The heat in the summer is very great in the valleys, and vegetation is rapidly brought forward. Most of the valleys are very fruitful, and produce corn, flax, and fruit, which thrives even at the foot of the mountains. The middle mountain-region is covered with forests, and the upper with fine Alpine pastures, which afford subsistence to numerous herds of cattle, and to a breed of remarkably strong and large horses. Wild animals become more and more scarce, but there are still chamois goats, marmots, bustards, and heath-cocks. The corn produced is in general of excellent quality, but not sufficient for the home consumption. The products of the mineral kingdom are gold, silver, copper, iron, lead, cobalt, arsenic, rock crystal, marble, saltpetre, salt, sulphur, asbestos, and serpentine. The once celebrated mines of gold and silver now yield little; those of copper, iron, lead, and arsenic are very productive, and the salt-works and marble-quarries are very important. There are properly speaking no manufactures; the country people make their own clothing. The inhabitants are a robust race; they are characterised by superstitious prejudices, but also by natural good sense, honesty, and industry, and are much attached to their antient festivals and sports.

Salzburg was formerly governed by archbishops, who possessed very great privileges. In 1802 it was secularised, and, together with Berchtesgaden, Eichstädt, and the greater part of Passau, assigned to Ferdinand, grand-duke of Tuscany, as an indemnity for that country, which was taken from him by the treaty of Luneville, in 1801, and erected into the kingdom of Etruria. Ferdinand was an elector of the German empire. By the treaty of Presburg, in 1805, Salzburg was allotted to Austria, and Eichstadt and Passau to Bavaria. Ferdinand, in exchange, received the principality of Würzburg, which had been secularised and given to Bavaria in 1802. By the treaty of Vienna, 1809, Austria ceded Salzburg to Napoleon, who gave it to Bavaria in 1810. After the peace of Paris, in 1814, Salzburg was restored to Austria, and Würzburg to Bavaria, and Ferdinand was reinstated in his Italian dominions. The religion of the majority is the Roman Catholic; formerly the Proestants were numerous, but Count Firmian, prince archbishop of Salzburg (who presided over the diocese from 1729 to 1733), oppressed and persecuted them in so cruel a manner, that above 30,000 emigrated to other countries in Germany, especially Prussia, to England, Holland, Russia, Sweden, and North America, where their industry and skill proved highly beneficial.

In antient times we find Salzburg inhabited by the Celts, who, as dwellers on the Tauern (which is the name they still give in their language to the mountains), were called by the Romans Tauisci. Under the Romans Salzburg belonged to the province of Noricum, and Juvavia was built by Hadrian on the place where Salzburg now stands. The decline of the Roman power led to the ruin of Juvavia, which was plundered and destroyed by the German tribes. The country was nearly a desert when the pious Scotchman, Hrodbert (Ruprecht or Rupert), arrived there towards the end of the seventh century, under the reign of Theodo II., of the family of the Agilolsfingers. He built a chapel on an island in the Waller lake, and preached the doctrines of Christianity to the ignorant inhabitants, who were gradually attracted in considerable numbers. Theodo had a monastery and church built for him, which was dedicated to St. Peter, and was richly endowed. Arno, the seventh successor of Rupert, was raised in 798, by Pope Leo III., to the archiepiscopal dignity by the consent of the emperor Charlemagne.

SALZBURG, the capital of the province, is situated in 47° 13′ N. lat. and 13° E. long., on the banks of the Salza, over which there is a bridge 370 feet long and 40 wide. The situation is one of the most picturesque in Germany. The city is surrounded with an amphitheatre of lofty Alps, which form a noble background to the view. The river runs between two isolated mountains, the Mönchsberg on the left and the Capucinerberg on the [illegible] leaving in many places only a narrow space on the [illegible] on which the city is built. The streets are [illegible] crooked, and the squares small, but regular. [illegible] are built of red marble from the neighbouri[illegible] with flat roofs. The magnificence of the [illegible] adorned the city with so many splendid build[illegible] in the Italian style, that Salzburg was [illegible] Rome. It is surrounded with walls and [illegible] eight gates, one of which, called the [illegible] sage cut through the Mönchsberg, 30[illegible] feet [illegible] high, and 24 broad. Salzburg is still the see [illegible] bishop and chapter. The university, fo[illegible]ed [illegible] abolished in 1800, and a lyceum or aca[illegible] its stead, which has a library of 30,000 vo[illegible] garden, and a geological museum. T[illegible] Peter has a library of 40,000 volu[illegible] theatre, four hospitals, a lunatic asy[illegible] charitable and useful public instituti[illegible] was built in the seventeenth century [illegible] tino Solari of Como, in the Roman style, wi[illegible] white marble. It is adorned with man[illegible] marble, and good paintings by Sandrart, [illegible] St. Peter's church contains the tombs of [illegible] pert. The fine church of the antient univers[illegible] 1696-1707, in a mixed Greek and Rom[illegible] Margaret's, a handsome edifice, was bu[illegible] church of the Benedictine nuns has some [illegible] glass windows executed in 1480. The p[illegible] Winter Residence is a very extensive build[illegible] with columns, but destitute of symmetry: [illegible] public offices. The square in front of it [illegible] the finest fountain in Germany, 45 [illegible] hi[illegible] tirely of white marble. On the op[illegible] is a magnificent palace called the [illegible] house and the palace of Count Kerenburg [illegible] buildings. The stables for 130 horses are [illegible] handsomest in Europe. A stream called [illegible] flows through them; the racks are of white [illegible] riding-schools, one for the summer, and [illegible] are attached to the stables. There are many [illegible] ings, for instance some of the 26 churches, [illegible] notice. In 1818 Salzburg was visited by a [illegible] flagration, which destroyed the beautiful chu[illegible] Holy Trinity, the two palaces of Count Ledron, [illegible] asylum, the splendid palace of Mirabell, which [illegible] mer residence of the archbishops, and the c[illegible] Sebastian, with the tomb of Paracelsus, and [illegible] public buildings, with 100 houses. The [illegible] mated at above five millions of florins. [illegible] bell and the church of St. Sebastian have [illegible] Salzburg is rich in Roman antiquities. [illegible] of [illegible] remarkable is a Roman bath, now in the [illegible] John's Hospital. A very fine mosaic [illegible] removed to Vienna, and the important co[illegible] quities, unrivalled in Germany, made by [illegible] on his estate near Salzburg, is now at [illegible] tress of Hohensalza, commanding the to[illegible] there is a most interesting prospect, is now used [illegible] There are in the town one military and three civil [illegible] an hospital for incurable patients, several sch[illegible] other useful and charitable institutions. [illegible] about 13,000, manufacture calicos, leat[illegible] and [illegible] and derive considerable benefit from two wel[illegible] fairs, and from an important transit trade b[illegible] eastern Austrian provinces and Bavaria, and [illegible] latter and Italy. The environs of Salzburg [illegible] respects highly interesting; the prospects fr[illegible] are most extensive, embracing a great variety [illegible] picturesque scenery.

(Jenny, *Handbuch für Reisende in* [illegible] *chen Kaiserstaate*; *Oesterreichische* [illegible] *pädie*; Blumenbach, *Gemälde der Oester*[illegible] *narchie*; *Conversations Lexicon*, 8th edition; *Dictionnaire de Géographie*.)

SALZWEDEL is the chief town of a cir[illegible] name, in the government of Magdeburg [illegible] Saxony, in Prussia, which is 470 square [illegible] and contains 40,000 inhabitants. The town [illegible] the river Jeetze, at its confluence with the [illegible] which junction it becomes navigable. It [illegible] walls and moats, and has six gates. [illegible] Jeetze into the old and the new town, and ha[illegible]

and Perwez. There are six churches, most of
erable for their antiquity, two hospitals, a gymna-
orhouse, and numerous public offices. The popu-
ounts to 7225. The principal manufactures are of
linen, cotton, gloves, shoes, tobacco-pipes, and
There are likewise tanneries, breweries, and dis-
The inhabitants carry on a considerable trade in
n, and hops, and export large quantities of their
factures, especially woollen cloths and linen. The
rounding country is supplied with shoes from this

DE'RA, a genus of plants of the natural family of
ceæ, which was named by Gærtner, though the
the name is unknown. The genus, though con-
t few species, includes Vittmannia of Vahl and
Lamarck. The genus is characterised by having
flowers. Calyx 4-5 partite. Petals 4-5, much
an the calyx. Stamens 8-10. Ovaries 5-seeded,
stalk-like gynophore. Styles as many. Fruit of
re carpels, usually drupaceous. The genus is com-
trees or shrubs, with simple alternate and reticu-
ed leaves. Peduncles are axillary or terminal,
when in fruit, and divided at the apex into a 5- to
d umbel. S. tetrapetala is a shrub, ten feet in
native of Madagascar. S. lucida (Niota lucida) is
rub, figured by Dr. Wallich, *Pl. As. Rar.*, t. 168,
erst, on the coast of Martaban. S. indica (pen-
f authors) is a large tree, a native of Southern
ecially on the Malabar coast, of which the fruit
are intensely bitter, like that of the other plants of
ia family.

NIANS, a Persian dynasty under the khalifs, of
founder, Ismael, was the first who had the title of
(king). As the Mohammedan possessions increased
the governors of the provinces gradually usurped
tended and less dependent power, sometimes re-
their spiritual and temporal superior the nominal
which at others they were content to pay. Amru
governor of this class, ruled Khorasan, Fars, and
his extent of dominion raised the jealousy of the
tadhedh, who stirred up against him Ismael Sa-
hief who had been for some time rising into a
which the first foundation had been laid by his
er Saman. Ismael passed the Oxus into the states
l, and prepared to dispute his possessions by arms;
ontest was decided in a more unusual manner.
of Amru took the bit in his teeth and carried
into the camp of the enemy. His soldiers, left
commander, fled, and thus a large portion of
s added to the dominions of the fortunate con-
t is said that Ismael sent an officer to console and
is prisoner, a kindness which Amru returned by
o his captor a list of the places where he had
treasures. Ismael however refused even to look
eating the offer as an attempt to throw upon him
incurred in the unjust accumulation of these
The ultimate cause of their discovery, say the
of this dynasty, was as singular as any part of this
ary correspondence. The ruby necklace of one
es of Ismael was carried off by a bird of prey, who
a piece of flesh. Pursued by soldiers with shouts
ng of arms, he dropped the splendid booty into a
n this well were found, after a diligent search, the
in question. Ismael was recognised as king by
h in 287 of the Hejira (A.D. 900), and reigned seven
s descendants who held this kingdom from father
ept in the last two instances, in which it passed
brother to another, were, Ahmed, Nasser, Noah,
ek, Mansor I., Noah II., Mansor II., and Abdal-
The dynasty was superseded by Mahmoud of
ho incorporated their dominions with his own em-
they had held the greater part of Persia for more
years.

R. [PHILIPPINES, p. 86.]

RANG. [JAVA, p. 98.]

RCAND is a town in Asia, in the khanat of Bok-
situated near 40° N. lat. and 66° 40′ E. long. It
ot far from the banks of the river Zer-afshan,
the centre of the fertile valley which extends on
of the river and is called El Sogd. The country
town is traversed by a great number of canals
used for the irrigation of the fields. The town is
in the history of Alexander the Great, under the name of Maracanda, the capital of the Persian province of Margiana, and seems to have been a flourishing town. (Arrian, *Anab.*, iv. 3.) In the times of the caliphs it acquired some fame as a seat of learning, but it attained its greatest glory in the fourteenth century, as the usual residence of the famous conqueror Timur. Ulugh-Begh, the successor of the great warrior, being of a different disposition, raised the fame of the town (in the fifteenth century) as a seat of learning, by his love of science, especially of astronomy. He ordered those astronomical tables to be made which go under his name. At that period it was a large and splendid town. But the family of Timur was driven from the throne and country by an irruption of the Uzbeks towards the end of the fifteenth century, and as their chief removed the royal residence to the town of Bokhara, Samarcand began to decline. We have no account of the present state of the town from an eye-witness. Meyendorff states that it still contains 50,000 inhabitants, that the mesids (lower schools) and medresses (high schools or colleges) are numerous, and built of white marble, which is got from quarries in the neighbourhood; and that the fronts are of varnished bricks, as in Bokhara. The tomb of Timur still exists: it is made of jasper. There are no traces of the observatory of Ulugh-Begh. Burnes says that the population is not more than 8000, or at most 10,000, and that gardens and fields occupy the sites where mosques and streets formerly stood. Yet there are still some buildings which attest its former splendour. Three of the colleges are perfect, and one of these, which formed the observatory of Ulugh-Begh, is very handsome; another college, Sheredah, is also of beautiful architecture. The tomb of Timur remains, and is under a lofty dome, the walls of which are beautifully ornamented with agate. Both travellers were prevented from going to Samarcand by the jealous policy of the government of Bokhara. There were formerly manufactures of silk-paper in this town, and it has been supposed that this article was first made there, but probably the invention passed from China to Samarcand.

(Meyendorff's *Voyage d'Orenbourg à Boukhara*; Burnes's *Travels into Bokhara, &c.*)

SAMARIA. [PALESTINE.]

SAMARITAN CHARACTERS, are the old Hebrew characters, which were disused by the Jews during the Babylonish captivity, but retained by the Samaritans, from which circumstance, and especially from their being used in the extant copies of the Samaritan Pentateuch, they have obtained their present name. They are nearly the same as the Phœnician characters. [ALPHABET, p. 382; HEBREW.]

SAMARITANS. After Shalmanezer, king of Assyria, had taken Samaria and carried the ten tribes of Israel into captivity (721 B.C.), he re-peopled the city of Samaria and the surrounding district, which formed the central part of Palestine [PALESTINE], from Babylon, Cuth, Ava, Hamath, and Sepharvaim; and these people, joined with the remnant of the Israelites, were from this period called Samaritans, and sometimes Cuthites. Being plagued with lions as a punishment for their idolatry, immediately after their establishment in the land, they asked aid of the king of Assyria, who sent them one of the captive priests of Israel to instruct them in the worship of Jehovah. The result was that they served Jehovah without renouncing the worship of their own gods. (2 *Kings*, xvii. 24-41.) When the Jews, returned from the Babylonish captivity, began to rebuild the temple at Jerusalem, the Samaritans requested that they might share in the work, pleading that they had worshipped the God of the Jews ever since their settlement in the land. Upon the refusal of this request, they did all they could to hinder the work, and at last succeeded in causing it to be discontinued till the second year of Darius Hystaspes, B.C. 520 (*Ezra*, iv.), and they afterwards offered similar opposition to the rebuilding of the walls of Jerusalem by Nehemiah. (*Nehem.* iv.) From this cause chiefly sprung the inveterate enmity which ever after existed between the Jews and the Samaritans. In the reign of Alexander the Great, according to Josephus, Manasseh, a brother of the high-priest Jaddua, having been expelled from Jerusalem for marrying the daughter of Sanballat, a Samaritan and governor of Samaria, fled to his father-in-law, who obtained Alexander's permission to build a temple to Jehovah on Mount Gerizim, and appointed Manasseh its priest. (Joseph., *Antiq.*, xi. 8.) Prideaux and Jahn think that Josephus has made a confusion between Darius Nothus and Darius Codomannus, and thus placed Sanballat in the reign of the latter; whereas he actually lived in the reign of the former, and was the great opponent of Nehemiah, by whom he is mentioned as having a son-in-law, who was a son of the high-priest Joiada, and was expelled from Jerusalem on account of his marriage with Sanballat's daughter. (*Nehem.*, xiii. 28; comp. Prideaux's *Connections*, i., p. 591; Jahn's *Biblische Archäologie*, ii. 1, p. 278; Winer's *Biblisches Realwörterbuch*, art. 'Nehemias.') The building of the temple on Gerizim seems to have put a final stop to the remains of idolatry among the Samaritans, but it widened the breach between them and the Jews, and from this period Samaria became an asylum for offenders against the Jewish laws. The Samaritans readily submitted to Alexander, and aided him in the siege of Tyre with seven thousand men. When Alexander marched into Palestine (B.C. 332), the inhabitants of Sichem, one of the chief cities of Samaria, requested exemption from tribute in the Sabbatical year, asserting that they were of Hebrew extraction; but when, in answer to the question 'whether they were Jews,' they replied that they were not, Alexander promised to consider of their request after his return from Egypt. Thither he took with him the Samaritans who had joined him before Tyre, and gave them lands in the Thebais. The next year, while Alexander was in Egypt, some Samaritans put to death Andromachus, the Macedonian governor of Samaria. The other Samaritans gave up the culprits to Alexander, who, not content with punishing them, drove out the inhabitants of Samaria, and planted in it a Macedonian colony. From this period Shechem, or Sichem, was the metropolis of the Samaritans. During the persecution of Antiochus Epiphanes, the Samaritans disclaimed all kindred with the Jews, and dedicated their temple on Gerizim to Jupiter Hellenius (167 B.C.). John Hyrcanus made war upon them, conquered Sichem, and destroyed the temple on Gerizim, after it had stood about two hundred years (about 129 B.C.); but the Samaritans still continued their worship on that mountain. (*John*, iv. 20.) Samaria formed a province of the kingdom of Herod the Great, who rebuilt the city of Samaria, and gave it the name of Sebaste. After Herod's death, it was subject to Archelaus, and was afterwards united to the Roman province of Syria. Samaritans are still found in their old country, especially at Nablous, near Sichem, and also in Egypt; and they have at various times corresponded with learned Europeans.

The religion of the Samaritans, at least after the building of the temple on Gerizim, differed but little from that of the Jews. They received however no part of the Hebrew scriptures except the Pentateuch [PENTATEUCH, SAMARITAN], but they expected a Messiah, and it is remarkable that their notions of his office were more correct than those of the Jews. (*John*, iv.; Horsley's *Sermons*, 24-26.) They have been accused by Christian writers of Sadducean tenets. (Josephus, *Antiq.*, xi., xii.; Prideaux's *Connections*; Jahn's *Biblische Archäol.*; Winer's *Biblisches Realwörterbuch*; Calmet's *Dictionary*; Kitto's *History of Palestine*.)

SAMBAWA. [SUMBAWA.]

SAMBOR, one of the nineteen circles of Austrian Galicia, has an area of 2124 square miles, with 300,000 inhabitants, of whom above 16,000 are Jews. It is bounded on the north-west by the circle of Przemysl, on the north-east by Lemberg and Brzezani, on the south-west by Stry, on the west by Sanok, and on the south by the kingdom of Hungary. The southern half of the circle is mountainous, with large forests; the soil in many parts is stony. The northern half is a plain and very fertile. The Dniester and the Stry are the two principal rivers, both of which rise in the Carpathian Mountains. The circle produces corn, pulse, and timber. Iron is found in the mountains, which supplies some smelting-houses. The salt-springs are of more importance. The breed of cattle is indifferent. The manufactures are inconsiderable; there are some of linen, hempen-cloth, thread, and wooden utensils.

SAMBOR, the capital of the circle, is situated in 49° 31′ N. lat. and 23° 14′ E. long., in a beautiful and fertile plain on the banks of the Dniester, 46 miles south-west of Lemberg. It is tolerably well built, and with the suburbs, which are much more considerable than the town itself, has 9000 inhabitants. There are here the civil tribunal for the circle, a criminal court, a district court for miners, a gymnasium, a high school, and other public institutions. The inhabitants manufacture and bleach linen, especially very fine damask. The making of salt likewise employs numerous hands. There is a government magazine for [illegible] in the environs there are exte[illegible] The town of Drohobiez, to whic[illegible] only 3116 inhabitants (viz. 478 Ch[illegible] is stated by Stein in 1818 to [illegible] Hassel, 1819, 7200; by Hörsc[illegible] by Cannabich, 1836, 11,290 inhabitants: we can[illegible] for this strange diversity.

SAMBRE. [FRANCE.]

SAMBU'CUS (from σαμβύκη, a musical i[illegible] name of a genus of plants belonging to [illegible] Caprifoliaceæ. It is known by possessi[illegible] rotate, urceolate, five-cleft corolla; five [illegible] sile stigmas; a roundish pulpy one-[illegible] crowned by the remains of the calyx, w[illegible] seeds. The species are low deciduous tr[illegible] rope and North America. The best know[illegible] of [illegible] is the common or black elder, *Sambucus ni*[illegible] small tree or large bush; the stem is irr[illegible] oppositely, branched; the young branc[illegible] a smooth grey bark, and filled with a [illegible] the leaflets are deep green and smooth, usu[illegible] one; the inflorescence is a cyme compo[illegible] cream-coloured flowers, with a sweetish bu[illegible] smell; fruit a globular purplish-black [illegible] stalks. This plant is a native of Europe, [illegible] and the colder parts of Asia. It is very c[illegible] parts of Great Britain, and is generally fo[illegible] habitations. Considerable medicinal v[illegible] been popularly attributed to this plant, [illegible] cently that it has fallen into comparative d[illegible] medical practitioners. The berries, flow[illegible] have been all used in medicine, and expec[illegible] phoretic properties have been attributed to [illegible] rural districts of England a wine is made [illegible] which is in great repute, and when drunk [illegible] able stimulant. The flowers are employed [illegible] distilled water, which is frequently used as a [illegible] on account of its agreeable odour is introduce[illegible] ticles of confectionery. The first year's bran[illegible] prived of their abundant pith, are in great [illegible] schoolboys for making pop-guns, [illegible] They have also been very generally [illegible] flutes and rustic pipes. The pith, on [illegible] and great lightness, is used for making [illegible] balls for electrical experiments. The [illegible] when pickled, form a good substitute for cape[illegible] ing, it is recommended as a good nurse for [illegible] the sea-shore, but it does not bear fruit [illegible] In the county of Kent, it is grown in or[illegible] for the purpose of obtaining the fruit. [illegible] good soil in a moist situation, and, for the [illegible] fruit in perfection, should be freely exposed [illegible] It will grow readily from cuttings and t[illegible]

S. Ebulus, dwarf elder or dane[illegible] its cymes with three principal bra[illegible] foliaceous stipules, and herbaceous ste[illegible] common plant in England and Scotland in waste places. It has a very fetid smell, [illegible] violently purgative.

S. Canadensis, Canadian elder: cymes [illegible] five branches; leaflets, four pairs and an odd [illegible] acuminated more or less, pubescent bene[illegible] are nearly scentless. It is a native of [illegible] throughout Canada to the Carolinas.

S. racemosa, red-berried elder: leaflets [illegible] oblong, acuminated, serrated, unequal at th[illegible] glabrous; flowers of a whitish-green colour. It is [illegible] of the south of Europe and Siberia. It is [illegible] and has a splendid appearance when covere[illegible] large scarlet fruit. Many other sp[illegible] worth cultivation on account of the[illegible] foliage. Amongst these, *S. la*[illegible] elder, and *S. pubens*, the downy [illegible]

SAMIELI is the Turkish name [illegible] Arabs call *samoom* or *simoom*, [illegible] in [illegible] *khamsin*, and in Senegambia [illegible] occurs in most countries which [illegible] tance from sandy deserts, and it [illegible] quarter in which the desert is sit[illegible] gambia and Guinea it blows fr[illegible] Delta of the Nile from the south-[illegible] on the eastern shores of the gulf of S[illegible]

ı Syria from the south-east, at Mecca from the east,
dad from the west, at Basra from the north-west, and
at from the north. These winds are extremely hot,
considerable quantity of fine sand is generally sus-
l in the air, which has been collected by the winds in
g over the desert. They affect the human body very
ully, producing great feebleness, and sometim• even
They usually consist of a quick succession of hot
ld puffs of wind; and the difference of the tempera-
tween these puffs, which is stated to amount to more
wenty degrees of Fahrenheit's thermometer, is pro-
ne of the reasons of their effect on animal bodies
o great. It is also thought that the hot puffs bring a
ıtial air, as a putrid and sulphureous smell is per-
when they blow. Formerly it was asserted that the
effects of the wind could be avoided by a person
ıg himself on the ground with the mouth downward;
dern writers say that the Arabs disapprove of such
eding, and perhaps justly, if it is true that the hot
eavier than the atmosphere. To diminish the effects
wind, the Arabs cover their faces with the *kefieh*, a
rchief which they wear on their heads.

NITES, an antient nation or confederacy of nations
al Italy, known in history for its bravery and long
e against Rome. The Samnites occupied an exten-
ct of country on both sides of the central ridge of the
nes, including the valleys of the Vulturnus, Tamarus,
lor, towards the Tyrrhenian Sea, and those of the
Tifernus, Trinius, and Frento, towards the Adriatic,
responding to the present provinces of Sannio and
ato Ultra, and parts of Terra di Lavoro, and of
o Citra, in the kingdom of Naples. The territory of
nnites was bounded on the north by the Peligni and
ini, and by the Adriatic, for the Frentani, who ex-
along the coast of that sea, formed part of the Sam-
nfederation, and were also of Sabine origin. On
t the Samnites were bounded by Apulia and Lu-
on the south by the Campanians, being divided
he latter by the ridges of Tifata and Taburnus,
the west by Latium Novum and the country of the

The Samnites were originally a colony of the Sa-
hich migrated in remote times, probably before the
g of Rome, to the banks of the Vulturnus and the
ıs, and thence spread on one side as far as the plains
lia, and on the other to those of Campania. They
n agricultural and pastoral people, and as their
s increased beyond the means of subsistence, they
d the custom of their Sabine ancestors, and sent
olonies, which were the origin of the Lucanians, who
lly extended as far as the southern extremity of the
ıla. The Samnites were divided into several nations
s, known by the names of Pentri, Caudini, Caraceni,
, and Frentani, the three first of which inhabited
ıntry designated by the name of Sabinium Proper,
the Frentani on the north, and the Hirpini to the
ast. Their principal towns were: 1, Bovianum, the
own of the Pentri, now Boiano, at the foot of the
ount Matese, near the sources of the Tifernus; it
cording to Livy (ix. 31), an opulent and important
art of the walls, formed of irregular polygonal stones,
nains. 2, Æsernia, now Isernia, on the opposite or
ı side of the Matese ridge. 3, Allifæ, now Alifi,
f Æternia, in the valley of the Vulturnus. 4, Ma-
n, afterwards called Beneventum. [BENEVENTO.]
lium, long since destroyed, stood near the modern
of Arpaia, on the road from Benevento to Naples.
anum, in the country of the Hirpini; its remains are
ıbella, near Frigento, not far from the sulphureous
Ampsanctus in the group of mountains which rises
n Basilicata, Apulia, and the two Principati. Virgil
vii. 563) gives a fine though poetically coloured de-
n of the phenomena of this lake, now called Mefiti
natives, which throws up its fetid water in jets to the
of about four feet in some places, accompanied by a
ıoise. 7, Telesia, now Telese, near the banks of the
alore. 8, Aufidena, or Alfidena, the chief town of
raceni, in the valley of the Sarus or Sangro, where a
still bears the name of Alfidena. 9, Acudunnia, in
ıntry of the Hirpini, on the site of the modern Lace-
on the borders of Apulia. 10, Taurasium, on the
alore, where there are considerable remains, and
sepulchral inscriptions near the modern village of
i. Pyrrhus was here defeated by Curius Dentatus. 11, Compsa, now Conza, in a strong position near one of the sources of the Aufidus or Ofanto. 12, Sæpinum, in the mountains east of Bovianum. 13, Abellinum, now Avellino. 14, Larinum, in the country of the Frentani, near the site of the modern Larino. 15. Histonium, near the site of the present town of Vasto. 16, Anxanum, the remains of which are on a hill near the town of Lanciano; and farther north, 17, Ortona, which has retained its name, and was the chief fortified town of the Frentani. The whole country of the Samnites was very populous, and full of towns or large villages, the names of many of which alone remain, without a trace of their site.

The Samnites brought at various times as many as eighty thousand armed men into the field. Their chief strength consisted in their infantry. Their government appears to have been a kind of aristocracy, in which the priests exercised a great influence. Livy (x. 38) portrays in a vivid manner the awful religious ceremonies with which they prepared for battle, and the fearful imprecations denounced against those who should turn their backs on the enemy In another place (ix. 40) he describes the army of the Samnites as splendidly accoutred, with shields embossed with gold and silver, and shining white and party-coloured tunics; and (x. 46) he speaks of two millions of pounds weight of coined copper taken from them by the younger Papirius: all which shows that the Samnites were no longer a rustic people, but were acquainted with the arts of luxury, which they had probably acquired from their intercourse with their Greek neighbours of Tarentum and of the coast of Campania. But they never became effeminate and corrupt like the Campanians, and they retained to the last their character for hardiness, perseverance, and devotedness to their country. Each of the nations of Samnite race had its own independent government, its magistrates, and its comitia. The chief magistrate of each nation was styled Meddix Tuticus, an Oscan denomination, as the Samnites appear to have spoken a dialect of the Oscan, and to have used Oscan characters. [OSCI.] It was only in cases of urgent necessity, such as resistance to a common invader, that the various Samnite states acted in concert, and then only for a time. This looseness and uncertainty of the federal union of the Samnites, if such it may be styled, was one main cause of the ultimate triumph of Rome over them, as well as over the Etruscans and other Italian nations, who were likewise divided into small independent states.

Between the years 330 and 333 of Rome, the Samnites attacked the Etruscans, who had settled in the plains of the Osci or Opici about half a century before, and who had founded or colonised Vulturnum, to which town the Samnites afterwards gave the name of Capua. (Livy, iv. 37.) According to Livy, the Etruscans, being weary of war, admitted a Samnite colony to share with them their houses and fields; but on the occasion of a great festival, when the old inhabitants were overcome by sleep after banqueting, they were murdered by the Samnite colonists, who formed the new state of Capua, or Campania Proper, which figured so much in the subsequent history of the wars of Rome [CAMPANIA.]

About 340 B.C., the first war broke out between the Samnites and the Romans. The Campanians of Capua, who were originally a mixture of Samnite colonists and Osci, were by this time an independent people, distinct from the Samnites proper of Samnium, and they had become corrupt and effeminate, like their Etruscan predecessors. The Sidicini, a small nation that inhabited the left bank of the Liris, being attacked by their Samnite neighbours from the mountains, requested the assistance of the Campanians. The latter came into the field, but were twice defeated by the Samnites, who, descending from Mount Tifata, overran the Campanus Ager, and laid siege to Capua. The Campanians then sent ambassadors to the Roman senate to ask for aid against their formidable enemies, to which the senate objected, that there existed a previous fœdus or alliance between the Samnites and Rome. The Campanian ambassadors in depair made a solemn surrender, in the name of their countrymen, of their towns and fields, the altars of their gods, and all they were possessed of, to the Roman people. Upon this the senate sent messengers to the Samnites to request them to abstain from molesting the Campanians, who were now subjects of Rome. The supreme council of the Samnites resolutely refused compliance, and some of their magistrates came out of the curia or council-hall, and in presence of the Roman for renewing the war. Pontius bitterly reproached Posthumius for this despicable subterfuge, and said to the fecialis that if the Romans did not approve of the treaty, they ought to send back the whole army to the same position which they had occupied previous to their surrender. He ordered his lictors to release the prisoners, and gave them permission to go where they pleased. The war was continued, and the Samnites took Fregellæ, a Roman colony, and killed all the inhabitants. One of the new consuls, Papirius Cursor, marched against Luceria, which was in possession of the Samnites, and in which the six hundred Roman hostages were detained. After defeating the Samnite army which came to relieve it, Papirius took the town and obliged the garrison to pass under the yoke. The war was carried on for several years, generally to the disadvantage of the Samnites, if we are to believe Livy's account, until 308 B.C., when the consul C. Marcius Rutilius was defeated and wounded, in consequence of which Papirius Cursor was named dictator, and he defeated the Samnites. But notwithstanding these repeated defeats, and the evidently exaggerated numbers of the Samnites, who, according to Livy, fell or were taken prisoners every year, and by which the whole country of the Samnites must have become depopulated, we still read of large Samnite armies appearing again in the field every succeeding year, and not only defending their country, but overrunning Campania, invading the borders of Latium, and fighting conjointly with the Etruscans, the Umbri and the Marsi, Pelgni and Hernici. Wars were carried on in those times in a very different manner from what they were afterwards, in the latter ages of the republic and under the empire. Every year a certain number of citizens, mustered under the new consuls, went into the field, fought a battle, and if successful, made an inroad into the enemy's territory, and after a few months, perhaps weeks, returned home with their plunder and captives. But the walled towns stood out against these inroads, and the country-people retired either within them or among the recesses of the mountains until the invaders were gone, and thus the country remained unsubdued. This was especially the case in a mountainous country like Samnium. In such a state of things, it would not have been practicable to send out colonies, as in a conquered country, and in fact we find that even the colonies which the Romans had placed in the countries of the Volsci, Ausones, Campanians, and Hernici, near the borders of Samnium, such as Sora, Fregellæ, Satricum, &c., either were taken by the Samnites or revolted against Rome, the original inhabitants rising against the Roman colonists and joining the Samnites. [COLONY.] But at last the strongholds of the Samnites began to fall. Bovianum, Luceria, Saticula, Allifæ, were taken one after the other, and the Samnite army, being defeated in the field by the consuls Postumius Megillus, after an obstinate combat, in which his colleague Minucius Augurinus was killed, and the Samnite general, Statius Gallius, was taken prisoner, the Samnites sued for peace, in the year 303 B.C. The senate sent the consul Sempronius Sophus with troops into Samnium to examine the real disposition of the people, and the Samnites having received the Roman soldiers in a friendly manner and supplied them with all necessaries, the senate granted them peace. (Livy, ix. 45.)

In the year 298 B.C. the Lucanians complained to the Roman senate that the Samnites had urged them to join in a new war against Rome, and upon their refusal were ravaging their borders. The Picentes also sent information that the Samnites had made to them proposals of alliance against Rome. The senate sent a message to the Samnites to abstain from annoying the Lucanians, which message being disregarded, a new war ensued. The Etruscans having joined the Samnites with a large force, in which were also auxiliaries from Cisalpine Gaul, the Romans chose for their new consul Q. Fabius Maximus, notwithstanding his great age, and P. Decius Mus (297 B.C.). In the mean time the Etruscan cities nearer to Rome having proposed peace, both consuls were at liberty to march against Samnium, Fabius by way of Sora, and Decius through Campania. After ravaging a large tract of country, Fabius met the Samnite army on the banks of the Tifernus, and for a long time the Romans could make no impression on the enemy's ranks; but at last Fabius having sent the hastati of the first legion round a mountain to attack the Samnites in the rear, the latter, thinking that the other consul with his army had arrived, made a precipitate retreat, leaving 3040 killed on the field and 330 p number, observes Livy, for such a victory. defeated near Maluentum some Apulian au the Samnites, the two consular armies spread Samnium which they ravaged for five months, di time Decius removed his camp to forty-five differ and Fabius to no less than eighty-six, leav traces of the devastation effected by their took the town of Cimetra, after which he Rome, and Decius remained to complete the ru nium. At last those Samnites who were sti being unable any longer to defend their countr in a body under their leader Gellius Egnatius i where they prevailed upon the chief men of states of that country to effect a general Rome, being joined also by the Umbri an mercenaries. Decius attacked and took b remaining towns of Samnium, Murgantia, Ro Ferentinum. The destruction of that unfortun appeared now to be complete, and yet we find in ing year not only the Samnites who had joined cans giving full employment to the consuls Vol Appius, but also a new host of Samnites desce their mountains, and overrunning the Falern Campania. The consul Volumnius hastened marches, and surprised the Samnites encum prisoners and booty on the banks of the Vult easily routed them. The Romans sent Rom to Minturnæ and Sinuessa to secure the Fale (Livy, x. 14, 21.) For several years after the Romans fighting in Samnium and on th Samnium, until Livy himself, after relating the u battles and victories, of thousands killed or sold observes that both the writer and his readers weary of these never-ending Samnite wars wh did not seem to weary out those hardy soldiers them (x. 31).

The Samnite host which had migrated into Etr bravely in conjunction with the Etruscans and on one occasion, near Sentinum, the Gallo-Samn disorder into the Roman ranks, when the consul perceiving the critical moment, devoted himself fernal gods, and rushing into the thickest of the covered with wounds. This act restored conf Romans, and they finally routed the enemy a loss on both sides.

At last, in the year 293 B.C., the consul L. of the former conqueror of the Samnites, Samnium, and having ravaged the country laid siege to Aquilonia, one of the last remain holds of the Samnites, near the Apulian borders, colleague Carvilius besieged Cominium. An 40,000 Samnites, 16,000 of whom were picked bound by solemn oaths to fight to the last, mov relief of Aquilonia. Papirius, having attacked with a desperate resistance, but on a sudden a g of dust arose, which was produced by the bagg which Papirius had sent round unobserved, a dragging after them a quantity of branches of tr the dust, the appearance of which imparted fres to the Romans, whilst it dispirited the Samnite wearied by their previous resistance. The Sam routed, and after losing a vast number of me Livy with probable exaggeration states at 30,0 mainder of the Samnite infantry took refuge wit lonia, whilst the cavalry rode off towards Bovian Aquilonia and Cominium were taken by the R burnt. Papirius next besieged Sepinum, which b after a brave resistance, and his colleague Carvi Volano, Palumbinum, and Herculaneum. The sn fell deep in the mountains, obliged the Romans to Samnium.

In the following year, 292 B.C., one of the new Fabius Gurges, son of Fabius Maximus, marche the Samnites, and was defeated by them with a se The senate proposed to deprive him of his comma his veteran father, deprecating this humiliation, o serve under his son as his legatus. A new battle wa in which the Samnites were finally routed. Pon conqueror at the Caudine Furcæ, was taken prison taking Venusia, to which the Romans sent a colony Fabii, father and son, returned to Rome, and th granted to Fabius Gurges the honour of a triumph,

rs ordered the prefects of the cohorts to proceed
elay to devastate the Campanian territory. Upon
his, the senate sent the feciales to declare war
e Samnites.. Two armies were ordered out, one,
consul M. Valerius Corvus, into Campania, and
under A. Cornelius Cossus, into Samnium. Va-
ter an obstinate fight, routed the Samnites, who
d their camp in the night. The Romans acknow-
at they never before met such stubborn enemies.
r consul having entered the confines of Samnium
lley of Saticula, at the foot of Mount Tifata, found
urrounded by the Samnites, who were posted on
hts. A legionary tribune named Decius Mus, by
pidity and quickness in marching up to a height
upied by the enemy, was the means of extricating
n army, which attacked and defeated the Samnites.
battle took place near Suessola, in the plain of
a, in which the Samnites were again defeated.
consuls re-entered Rome in triumph. In the fol-
ear a formidable mutiny, which broke out in the
rmy, and which was with difficulty quelled by the
alerius Corvus, prevented any active operations in

In the subsequent year, the consul L. Aemilius
us, entered the country of the Samnites, who
peace, and obtained it. This was followed by a war
the Samnites on one side, and the Sidicini, Latini,
panians on the other, which led to the final war be-
Latins themselves and the Romans, and the total
n of the former. [LATINI.] In this last war the
appeared as auxiliaries of Rome.

year 323 B.C. a new war broke out with the Sam-
the occasion of the Romans besieging the Greek
Palæopolis, which was garrisoned by a party of
, but which the Romans took by a secret un-
ing with the inhabitants. The Samnites were
the Lucanians. L. Papirius Cursor being ap-
lictator to carry on the war, his master of the horse,
s Maximus Rullianus, attacked the Samnites in his
and against his orders, and defeated them, but for
ch of discipline he was condemned to death by the
and only saved by the interference of the soldiers
e people of Rome. [PAPIRII.] Papirius himself
the Samnites, who asked for and obtained one year's
ut before the expiration of the truce, the Samnites
gain attacked the Roman territory, the dictator, A.
s Arvina, with M. Fabius Ambustus, his master of
e, was sent against them. The Roman army, being
by the enemy in an unfavourable position, after five
sperate fighting was in danger of being totally de-
hen the Samnite cavalry, seeing the baggage of
ans moving away in the rear without protection,
rward in disorder for the sake of plunder. The
who expected this, allowed them to begin plunder-
then ordered his own cavalry, which he had kept
e, to fall upon the enemy's horse, which were cut
The Roman cavalry then returning, attacked the
infantry in the rear, while the Roman legions
hem in front with renewed ardour. At last the
gave way, and the defeat was complete. Their
vas among the killed. This disaster disheartened
ites, who exclaimed that this was a consequence
having broken the truce, so that the wrath of the
ht to be appeased. Accordingly the magistrates
hat Brutulus Papius, one of the chief men in the
who had instigated the renewal of the war, should
up to the Romans, together with his property, as
e Roman prisoners who were in the hands of the
But Brutulus killed himself, and his body was
Rome, together with the prisoners. The Roman
clined taking the property of Brutulus, and also
grant peace to the Samnites. (Livy, viii. 23, 39.)

following year, 321 B.C. the Samnites having made
parations for war, gave the command of their forces
Pontius, son of Herennius, an experienced officer,
already served against the Romans. He placed
in ambuscade in a defile between Mount Taburnus
ffset of the Tifata ridge, through which flows the
er Isclerus, an affluent of the Vulturnus. This
lirect road for the Roman army, which was posted
north of the Vulturnus, to proceed by to Malu-
BENEVENTO.] Pontius sent emissaries, disguised
rds, towards the Roman outposts, who, being seized
tioned said that the Samnite forces were then engaged in besieging Luceria, a town of Apulia, which was in alliance with Rome. The consuls T. Veturius Calvinus and Sp. Posthumius, after some consultation, resolved to march to the assistance of Luceria by the most direct way, which was across the Vulturnus, at the confluence of the Isclerus, and then through the defile towards Maluentum. Advancing through a narrow gorge, they came to a little valley between the mountains, and farther on to another narrow defile, which they found barricaded with trunks of trees and pieces of rock, and looking up they saw the Samnites posted on the hills. The Romans thought of retracing their steps, and recrossing the little valley, but they found the other narrow pass, leading to the banks of the Vulturnus, also barricaded and defended. The consuls then ordered the army to encamp in the plain and to fortify themselves. The Romans spent the night in a state of discouragement, whilst the Samnites held council concerning what was to be done with the Roman soldiers when they surrendered. They sent to consult Herennius, the father of their general, an old man, retired from active life, who had a great reputation for wisdom. His answer was, to open a passage for the Romans and let them retire without molestation. This appeared absurd to the Samnite officers, who sent a second message to Herennius, who then said that they should put to death the whole Roman army. Puzzled at these contradictory opinions, the Samnites sent for Herennius himself, who was brought in a cart to the camp, and appearing in the military council, explained his meaning:—'If you follow my first advice,' said he, 'your generosity will win you the affection and friendship of a powerful nation; if you refuse that, then you must destroy the Roman army, by which means you will render Rome unable to annoy you for a long time to come.' 'But,' said his son, and others with him, 'supposing we take a middle course, and dismiss the Romans after imposing upon them those conditions which befit a conquered army?' 'By this means you neither make friends nor get rid of enemies; you spare those who will never forgive you for their own humiliation, and who will take the first opportunity of revenging themselves.' The advice of Herennius however was rejected. The Romans, after attempting to break through the surrounding enemy, and feeling the want of provisions, sent messengers to ask for honourable conditions. Pontius told them that they must consider themselves his prisoners, and as such give up their arms and file off, under a yoke or gallows, in presence of the whole Samnite army, after which they would be allowed to return home; that at the same time peace should be concluded between the two nations on fair conditions; that the Romans should evacuate the Samnite territory and withdraw the colonies which they had placed on the border, and a treaty of mutual alliance be entered into. The consuls, after much hesitation, replied that they could not conclude an alliance without the consent of the Roman people, but they and all the officers, submitting to necessity, subscribed to the conditions of peace dictated by Pontius, they and the legionary tribunes becoming personally guarantee for their fulfilment, besides leaving six hundred hostages in the hands of the Samnites. Then came the ceremony of passing under a yoke one by one, the consuls first, despoiled of their consular robes and other insignia of their rank, then the officers in like manner, and lastly the common soldiers, amidst the taunts and threats of the surrounding Samnites, who struck and even killed those of the Romans who showed any resentment for the insult. The spot on which this transaction occurred became known by the name of the 'Caudine Forks,' from its being in the neighbourhood of Caudium.

When the news of this mishap reached Rome, it produced universal consternation. The conditions of the peace being discussed in the senate, the consul Posthumius proposed to annul the treaty, offering to surrender himself, and the tribunes who had signed it, to the Samnites. Two of the tribunes of the people contended that this was not sufficient to annul the solemn engagement made with the Samnites, but they were overruled, and Posthumius and the legionary tribunes, escorted by a fecialis, were led back to the Samnite camp, with their hands bound, and given up to Pontius, the fecialis saying that they were guilty of concluding a treaty without authority. Posthumius, pretending to be offended, struck the fecialis, and then drawing back, cried out, that as he was now a Samnite, and as such had struck an envoy of Rome, he had thereby afforded a sufficient reason to Rome

Pontius appeared with his hands tied behind his back: after the ceremony, he was beheaded.

In the year 290 B.C. the Samnites, worn out by their repeated defeats, sued for peace, which the Romans, likewise exhausted by their dearly-bought victories, felt disposed to grant. The consul M. Curius Dentatus, being charged with the negociation, concluded a peace, the conditions of which are not known. (Livy, *Epitome*, xi.) 'Thus,' says Eutropius (ii. 9), 'ended the Samnite war, which had lasted forty-nine years, against the most persevering enemy that the Romans had to encounter within the boundaries of Italy.' The result of this war, or succession of wars, was that the Romans extended their power over South Italy, Campania, and Apulia, and thus became neighbours, and soon after enemies, of the Tarentines. The Tarentine war brought on the expedition of Pyrrhus into Italy, and the first war of the Romans with an enemy from beyond the limits of Italy. In the war of Pyrrhus, the Samnites joined that prince, after whose second retreat from Italy and subsequent death they found themselves attacked by two Roman armies, under their old antagonists L. Papirius Cursor the younger and S. Carvilius, who utterly defeated them (272 B.C.). It was then that Samnium became a conquered country, and the Romans sent colonies to Maluentum and other places. Florus says that Samnium ceased to exist, meaning as an independent state; and those who reckon this as the end of the Samnite war, give it a duration of seventy years, in which however there were considerable interruptions.

In the war of Hannibal the Hirpini joined the Carthaginians after the battle of Cannæ, but the Pentri did not. At last, in the Social War, the Samnites having joined the Marsi, Vestini, Peligni, and others in the common league against Rome, remained last in the field, and were defeated and slaughtered without mercy by Sulla, who exclaimed that Rome could enjoy no repose as long as a number of Samnites could collect together. The devastation of Samnium by Sulla was most effectual; the towns were burnt and razed to the ground; Beneventum alone was spared. The last time the Samnites appear in history is during the war of Sulla against the younger Marius, when Pontius Telesinus, who had joined the latter at the head of 40,000 Samnites and Lucanians, stole a march upon Sulla, who was besieging Præneste, and advanced within ten stadia of Rome, which was without any adequate defence. Telesinus told his own Samnites that he was the enemy of both Marius and Sulla, and that his object was to destroy Rome and restore freedom to Italy. Sulla however came in time to save the city. A desperate battle ensued; the Samnites defeated the left wing of the Romans, commanded by Sulla himself; but Crassus, who commanded the right wing, having defeated Carina, a Roman officer of the party of Marius, who was opposed to him, fell upon the flank of the Samnites, who were obliged to retire to Antemnæ, where Telesinus was killed. Between seven and eight thousand Samnites surrendered to Sulla, who marched them to Rome: and having shut them up in the Circus Maximus, had them all butchered in cold blood, while he was haranguing the senate in the neighbouring temple of Bellona. The remainder of the Samnites were slaughtered in the same manner at the taking of Præneste.

SAMOGI'TIA, now only an historical name, is an extensive tract of the antient duchy of Lithuania, bounded on the north by Courland and the Baltic, on the west by the Baltic and Prussia, and on the south and east by Lithuania Proper. It produces abundance of corn, honey, wax, timber, horses, and game. It now forms part of the Russian government of Wilna. The inhabitants have retained in greater purity than any others the peculiar customs and language of the Lithuanians. The places deserving of notice are, Kieydani, a colony founded by Prince Radzewill for some Scotch emigrants, where they long flourished; and Polangen, the harbour of which, once of considerable importance, was filled up with earth by the Swedes at the instigation of the merchants of Riga.

SAMOS, an island in the Grecian Archipelago, called by the Turks *Susam Adasi*, lying between 37° 35′ and 37° 48′ N. lat., and extending from 26° 36′ to 27° 8′ E. long., situated on the coast of Asia Minor, at the distance of about a mile from the promontory of Trogilium, or Cape Santa Maria, which lies between the gulf of Scala Nova and that of Balat.

The word Samos, as we are told by Strabo (viii. 503), means a mountainous he [illegible], and
sidered as characterizing the
while the names Dryusa, An[illegible],
Cyparissia, given to it by the Greeks, are des
fertility and varied produce. Its early history
fable. We find mention of Ancæus rulin
Carians and Leleges, and of a subsequ
after the return of the Heraclidæ, of Lesb[illegible]
laus, and Ionians expelled from Epidaurus und
the Carians consenting to incorporate the new
their city. The date of this settlement is pro[illegible]
988 B.C.

Very soon after the year 776 B.C., the
came remarkable for maritime enterp
merce. They were the first to avail th
improvements in ship-building, originat
dides tells us, at Corinth (Thucyd., i. 13),
find them trading with Egypt under the pro
Psammetichus, who gave them a settlement
B.C. 630, a Samian merchant, Colœus, made a
voyage to Tartessus in the extreme west of
World, and brought back, as Herodotus tells us
private fortune he had ever known made by tr
During this period they founded several colo
thrace, Anoea, Perinthus, Bisanthe, Amorgus,
the confederacy on the Asiatic continent, called
nium, consisting of twelve cities. Scattered noti[illegible]
early kings and petty wars with Ephesus, P
in the antient historians, and have been w
Panofka, in his work, 'Res Samiorum.'

In the time of Cyrus and Pisistratus, the gover
island was in the hands of Polycrates, the
of the tyrants of his day. Having obtaine
of the island by stratagem, he established h
tyrant, and became very powerful: he ex
the neighbouring states, Lesbos, Miletus
navy than any other Grecian prince o
he was also strengthened by his al
king of Egypt. Shortly after the in[illegible]
Cambyses, Polycrates became engaged in
dæmon, in which the Spartans were fi
the island. His increasing power at le
jealousy of the Persian monarch I
Oroetes, allured him by treacherous pro[illegible]
in his power, and then murdered him. Hero
says of Polycrates that he perished in a
of himself and his high designs, and that
tyrants, with the exception of those of Sy
compared with him in greatness of charac
consistent with all we read of Polycra[illegible]
have designed to make Samos the mistress o
pelago, and to have neglected nothing that c
her greatness, either by the skilful conduct
foreign policy, or the cultivation of the arts
He surrounded himself with all the princely
the wealth of that time could procure.
physician and Anacreon the poet were in
said to have transported superior breeds
other countries. (Athenæus, lib. xii., p.
seal was made by Theodorus, a celebrated artis[illegible]
curious anecdotes of him may be found
Athenæus just quoted. The mole in
Samos, of which Herodotus speaks, was probal
under his directions.

During his reign, Samos, enriched by her
Egypt and the Mediterranean, and strengthe[illegible]
decline of the states on the Asiatic continent.
her sovereignty over the Archipelago in such
to provoke the jealousy of the Persian govern[illegible]
the treacherously-contrived death of Polycrates,
deprived of his guidance, and a prey to civil wa[illegible]
the hands of Darius, who appointed Syloson.
Polycrates, as governor. The resistance o
to this measure led Otanes, the Pers[illegible]
mand, to order a general massacre, and
up to Syloson almost unpeopled.

Shortly after this, we find the Samians
revolt of Ionia, and expelling their tyrant, A[illegible]
of Syloson. They contributed a large force at
Lade, but treacherously withdrew from the e
obtain favour with Darius, to whose empi[illegible]
again made subject, but were released fr
battle of Mycale.

T ritime strength of Samos was broken, and their go- made democratical by Pericles, B.C. 440, who took opportunity afforded by a quarrel between this island Miletus to crush a power which might otherwise have a dangerous subject, if not a formidable rival, of Athens. the expedition of the Athenians to Sicily, during the ponnesian war, Samos, like Athens, became agitated a struggle between the oligarchical and democratical ties, terminating in the triumph of the latter. After battle of Aegospotami, the Samians, alone remaining in their alliance with Athens, sustained a siege from nder, and were compelled to submit to Spartan prin- of government. After this time the island fell into hands. The Athenians, Lacedæmonians, and Per- became successively possessed of it, and it was finally red to its early masters by Timotheus, and was pro- ted by Athens as her ally during the Social War (B.C. Little mention of Samos is made in the history of cedonian period. Its valuable situation as a naval n made it the prey of the great monarchs then con- against each other, and after forming part of the Macedonian, and Syrian empires, it was finally subject to Rome, B.C. 84. Samos was afterwards the nce of Marcus Antonius and Cleopatra, B.C. 32, and of stus, who gave its inhabitants a titular freedom. reduced by Vespasian to the form of a province, the memory of its antient glory was preserved as the time of the emperor Decius by the inscription πρώτων 'Ιωνίας on its coins.

The antient history of Samos exhibits very strikingly the and virtues of the Ionic race. In love of liberty, in rcial and naval activity, in fondness for art, not less luxury and fickleness of character, they very much bled their Athenian masters, while no Greek state at early a period as the time of Polycrates perhaps equalled n the variety of their mercantile relations and enter- n navigation. We find them in close alliance with king of Egypt, who granted them a separate tem- e establishment for Greek merchants at Naucratis, heir trade with Africa must have been carried on not by the assistance of the Cyrenæans, but by their set- ment at an oasis in the desert, seven days' journey from bes, an outpost of Greek civilization discovered by the of Cambyses on their invasion of that continent. od., iii. 20.) Closely connected with their trade with pt is the history of the early art of Samos. A school culptors, beginning with Rhœcus and his sons Theodo- and Telecles, at a period (according to Pliny, xxxv. 43) before the expulsion of the Bacchiadæ from Corinth, ued till the time of Polycrates. (Müller's *Archæo- der Kunst*, 60, 71.) Theodorus is said to have in- d the art of casting in bronze, and of him and his r the well-known and remarkable anecdote is told, r their stay in Egypt, they formed a statue, one- lf being made at Ephesus by Theodorus, the other at by Telecles, and that the two halves tallied exactly. ut entering into the question of the general origin of art, it seems probable from this, that the intercourse n Egypt and Samos had led these two artists to itate the prescribed forms and unchanging proportions of art of the elder country. The stiffness of the early style much improved upon by another Theodorus, son of cles, in the time of Polycrates, and the skill of the Sa- ns in working metal had been already shown in the ecution of the brazen caldron dedicated by Colœus to the le of Juno at Argos, and ornamented with colossal es and heads in high relief.

In the sister arts of architecture and painting the Sa- ns were also eminent. Rhœcus, who has been already ioned, built the Heræum, or temple of Juno, the st which Herodotus had ever seen (iii. 60). In this le was a statue of the goddess by Smilis (an artist said Pausanias to be a contemporary of Dædalus), of a very haic form, as we may see from its representation on the ins of the island.

Mandrocles, a Samian, built the bridge over the Bosporus Darius Hystaspes, and also caused a painting to be made his work and of the monarch passing over it with his my.

Notices of Calyphon, Timanthes, and other Samian inters, are collected from Pausanias and other sources Panofka, 'Res Samiorum,' 55, who also quotes passages to w that the natural genius for design in the islanders showed itself in the improvements introduced by them in ship-building. The coins of Samos are very numerous and worthy of attention. The earliest autonomous coins bear the head of a lion or of a bull; a winged wild boar or a prow of a ship are common reverses. Juno, with her attributes, and Neptune, Vulcan, and Minerva, are deities represented upon the imperial coins, the series of which extends as far as Saloninus junior; the usual reverse is the archaic figure of Juno, which resembles very much that of Diana on the coins of Ephesus; for a more particular description of which see Mionnet, *Description des Médailles Antiques* This statue was still standing in the temple in the time of Pausanias.

Pythagoras, who was a native of Samos, is also represented in a sitting attitude on the imperial coins, touching a globe placed on a column with his hand, with the inscription, ΠΥΘΑΓΟΡΗC CAMIΩN. Other types are Meleager attacking the boar, the river Parthenius personified, Nemesis, &c.

After being made a province by Vespasian, Samos was constituted the head of a theme under the Byzantine emperors. It was plundered and taken by the Arabs in the eighth century, and recovered by Leo in the thirteenth. A Turkish chief, Tzachas, seized it for a short time, but was soon deprived of it by Johannes Ducas. It was in the hands of the Venetians, and afterwards of the Genoese; and upon the taking of Constantinople (1453), was ravaged by Mahomet II. Selim granted permission to one of his subjects, Kilitsch Ali Bassa, to colonize the island, as the population had been much reduced by frequent piratical invasions. It has continued ever since under the dominion of the Turks: the inhabitants made an unsuccessful attempt to free themselves during the late Greek revolution, in which the archbishop and clergy did not join.

The form of the island of Samos is irregular and indented; the greatest length is from west to east, and the circumference is about eighty miles. It is separated from the continent of Asia by a narrow strait or boccage about six miles in length, and nowhere more than three in breadth, full of small islands. Through the island in a direction from east to west runs a high mountain called Ampelus by Strabo, a continuation of the promontory of Trogilium, and terminating at its western extremity with the height of Kerkis, the Mons Cercetius of the antients, the loftiest point in the island.

Immediately opposite to Cape Santa Maria, between the rivers Metelenous and Imbrasius, is the port of Tigani, the antient harbour of the city of Samos, which has an artificial mole built across it from north to south. Herodotus speaks of an immense mole in this harbour, which he considers one of the three works most worthy of mention in the island. A little inland at the distance of about five miles from Cape Santa Maria is the site of the antient town of Samos. From the existing ruins Pococke (*Travels in the East*) gives a ground-plan of it, from which it appears that it was situated to the west of the port, partly on flat ground, and partly occupying the south side of Mount Ampelus; the walls, of which there are still remains, are cased with white marble, and have square towers. At about sixty paces interval they enclose a quadrangular space; within them are the ruins of a theatre with the seats, built on the side of a hill. To the west of the city, towards the Imbrasius, are the remains of an aqueduct, which does not seem to be the one mentioned by Herodotus (iii. 60), which was carried through a mountain, and was one of the three works which he considered most worthy of admiration at Samos. Of the great temple of Juno hardly anything remains except a capital and base, engraved in Tournefort. (*Voyage du Levant.*) Its dimensions were ascertained by Mr., Bedford, an architect who accompanied Sir William Gell in the second Asiatic mission of the Dilettanti, to be—length 346 feet; breadth 189. It was a decastylus dipterus; had ten columns in front, twenty-one on the sides, a triple row in the pronaos, and a double row of four columns between the antæ at the entrance of the cella in front. The columns were about seven feet in diameter at the bottom of the shaft, and about sixty feet high. The intercolumniation in the two fronts was fourteen feet, in the flank only ten feet and a half, and in the flank of the pronaos something still less. There was no appearance of fluting in the columns. The material was the white and bluish-grey marble of the island. (Leake's *Asia Minor*, 348.) Opposite to the old city, about a mile to the west of it, is the modern town of Cora, or Μεγαλη χωρα, the largest in the island, containing, in Pococke's time, about twelve small churches and two hundred and fifty houses. On the south side of the city is a large plain called Megalocampus, which has become a stagnant marsh. To the west of Cora is the river Imbrasius, on which is the small village of Mily. At the mouth of this river the land juts out to the south, terminating in Cape Colonna, opposite to the small island of Samopoula. To the west of this promontory is the village of Marathrocampos, about forty miles distant from Patmos. Three miles from this village, opposite to the island of Nicaria, and distant from it about twelve miles, is a hermitage called St. George's, with a grotto near it, on the top of Mount Kerkis, called Panagia Phaneromena. The summit of this mountain is covered with snow all the year round, and has a lake at the top.

Five miles from Marathrocampos towards the north is the village of Castany. Proceeding along the coast in a north-east direction we come to Carlovassi, the most considerable town in the island after Cora. The port is a bad one, being much exposed to the north wind. Three miles to the east of this town is Farni, a village, ten miles from which, in a deep bay, is Vathi, a town with a good harbour cacapable of holding a large fleet. There is a small harbour four miles to the north-east, the mouth of which is well protected by little islands. On the east side of the island is another port, which Tournefort (*Voyage du Levant*) calls the Port des Galères. These are the principal geographical points in the island. The soil of Samos is very fertile, and produces very good wine, though this was not the case formerly, according to the testimony of the antients. The muscat grape is much cultivated. There is good timber on the hills, which have quarries of white marble in abundance.

Samos was formerly celebrated for its pottery, which was made from a particular kind of clay found in the island.

Travellers speak of the abundance of game and wild animals in the island.

The inhabitants, about 15,000 in number, living in eighteen villages, are nearly all Greeks; they are described by Michaud and Poujoulat (*Correspondance d'Orient*, 1833) as being wretched in their condition and habits, and of a savage appearance. They are governed by a waiwode and cadi; the former has the care of the revenue, and the latter administers justice. There is also a Christian governor, called an aga, chosen by the people. From Pococke's *Travels in the East* we get the following statement of the amount of the revenue yearly accruing from Samos in his time:—land-tax, 22 purses; harach or poll-tax, 20 purses; avancos, or fines on deaths and for crimes, 10 purses. Samos is the see of an archbishop, who is also bishop of Icaria. His lands, with those belonging to the papas or priests, and caloyers or monks, are more than half of the whole island. A minute account of the state of the Greek church in Samos may be found in a rare work translated into English, under the following title: 'A Description of the Present State of Samos, Nicaria, Patmos, and Mount Athos, by Joseph Georgirenes, archbishop of Samos,' London, 1677; which may be also referred to generally for an account of the condition of the island during the seventeenth century.

For further information see Dapper's *History of the Archipelago;* Panofka, *Res Samiorum;* Tournefort, *Voyage du Levant;* and Beauvau, *Voyage du Levant*, Nancy, 1619; in which work a bird's-eye view of the island is given.

SAMOTHRA'CE (Σαμοθρᾴκη), a small island opposite the mouth of the Hebrus in Thrace, from which it was 38 miles distant according to Pliny (iv. 23). It was chiefly celebrated for the worship of the Cabiri, which was said to have originated in this island. [CABIRI.] According to Herodotus (ii. 51), Samothrace was originally inhabited by the Pelasgians, from whom the inhabitants learnt the religious mysteries which they solemnized.

In Homer the island is usually called Samos (*Il.*, xxiv. 78, 753), or the Thracian Samos (*Il.*, xiii. 12), and was said, according to some accounts, to have derived its name from a colony from the island of Samos on the coast of Asia Minor, who settled there (Paus., vii. 4, s. 3; Strabo, x., p. 457); but Strabo, who did not believe this account, derived its name from *samos*, which meant a height, or from the Sai, whom he supposed to be the antient inhabitants of the country. Other accounts state that it was originally called Dardania, and that [illegible] founder of Troy, passed over from this island [illegible] (Strabo., vii., p. 331.)

The Samothracians joined the army of Xerxes [illegible] invaded Greece, and one of their ships disti[illegible] at the battle of Salamis. (Herod., viii. 90.) [illegible] Pliny it was a free state.

Samothrace, according to Pliny, was 32 mi[illegible] ference. It contains a very high mountain, [illegible] by Pliny, from which Homer says that Troy [illegible] (*Il.*, xiii. 12.)

SAMOYEDES, one of the most widely spre[illegible] nations of Northern Asia. The tribes of the [illegible] inhabit two large tracts, one of which extends alo[illegible] of the Polar Sea, and the other on both sides [illegible] Mountains. Thus there are northern and [illegible]moyedes.

The Northern Samoyedes wander about in the [illegible] which occupies the western portion of the coast [illegible] The most eastern point at which they are found is [illegible] of Taïmooras, which lies west of the peni[illegible]nates in the North-east Cape, the most [illegible] Asia. From this gulf westward they occupy [illegible] coast to the Ural Mountains, and they are e[illegible] of that range, on both sides of the river Pe[illegible], [illegible] the banks of the river Mezen. Thus they inhabit [illegible] of the Polar Sea between 45° and 100° E. long. [illegible] of short stature, seldom attaining five feet, and [illegible] the Tungooses in the conformation of their body. [illegible] round, broad, and flat faces, thick lips, a broad [illegible] nose, very little beard, and very coarse black hair. [illegible] are stout, and have muscular limbs. They have [illegible] rein-deer, but they use this animal only for dra[illegible] sledges. They do not milk them, nor do they [illegible] flesh. They live chiefly on the produce of the [illegible] which the principal object is the wild rein-deer, [illegible] their country abounds, and which supplies all the[illegible] They take also several kinds of fur-bearing an[illegible]cially foxes. The sea supplies them with white [illegible] some other animals, and dead whales are occasion[illegible] to their shores. From time to time they occupy t[illegible] with fishing in the rivers and lakes, but the chase [illegible] principal employment. They are heathens, and [illegible] the religion called Shamanism. It is stated t[illegible]merous tribes which belong to the Northe[illegible] contain 70,000 individuals.

The Northern Samoyedes are divided from their [illegible] kinsmen by an immense tract of country, occupied [illegible] Ostiaks, and several tribes that belong to the [illegible] especially the Tchapogires.

The Southern Samoyedes inhabit that [illegible] Altai Mountains which extends from the [illegible] the river Tshulyshman, one of the principal [illegible] of the river Obi (near 88° E. long.), to the [illegible] extremity of Lake Baïkal, or to 105° E. l[illegible] approach the banks of the river Sele[illegible] seat of the Samoyedes in this part is th[illegible] between two chains, called Erghik Targak Taiga, [illegible] the Tangnu Oöla, on the south [ALTAI MOUNTA[illegible] p. 398], in which the two principal branches [illegible] Yeneseï river, the Ta-Kimu and the Kemtshyk, hav[illegible] origin. This country is included within the terri[illegible] the Chinese empire; and these Samoyedes, called [illegible] are tributary to the emperor of China, and o[illegible] military service along the frontier. Some [illegible] Samoyedes inhabit the northern declivity [illegible] Targak Taiga range, where they are subject to [illegible] pay a tribute of furs. They extend northwar[illegible] banks of the Yeneseï to Abakansk, and along the U[illegible] tributary of the Upper Tunguska, to Nishnei Ud[illegible] Some of these tribes live entirely on the produce [illegible] chase, such as elks and different kinds of deer, [illegible] large species called marali. They also take [illegible] squirrels, with the furs of which they pay their [illegible] Other tribes have herds of rein-deer, their country [illegible] the most southern region in which that animal [illegible] in Asia. They use the males as hunting animals, [illegible] females supply them with milk. A few have adop[illegible] culture, but they eat also the roots and stems of some [illegible] growing plants. The Soyotes, or Chinese Samoyedes, however, inhabit a rich pasture country, and live on the prod[illegible] of their herds, consisting of horses, black cattle, and [illegible] These Southern Samoyedes exactly resemble their [illegible] insmen in the formation of their bodies, except that they ave a tolerably thick beard. The different tribes of the moyedes speak different dialects of one language, which aries greatly from the languages of all the neighbouring ations, though it contains a considerable number of roots hich occur in the languages of some nations of Central sia.

(Pallas, *Reisen durch verschiedene Provinzen des Russis- n Reichs*; Klaproth, *Asia Polyglotta*; Ritter, *Erd- unde von Asien*, vol. i.).

SAMPHIRE, an herb in much request in some parts of country as a salad and pickle. The true Samphire is *Crithmum maritimum*, a plant belonging to the natural er Umbelliferæ. It is a very succulent plant, with pale- een leaves, and flowers arranged in umbels. It grows on cks by the sea-side. The species of Salicornia [SALICORNIA] re often called Samphire, and are used in the same manner, ut they are very much inferior to the Crithmum as an rticle of diet.

SAMPOO, river. [BRAHMAPOOTRA.]

SAMSOE, OLE JOHAN, was born on the 2nd of rch, 1759, at Nestved, where his father was a person in circumstances. At first he was educated at home by a rivate tutor, but was afterwards sent to the school at Cold- , of which Justitsraad Thorlacius was then the rector. e proceeded thence to the university of Copenhagen, where e distinguished himself by his superior abilities and attain- nts, and where he formed some literary friendships. One his most intimate associates was Rahbek, with whom he out on a tour through Germany in the summer of 1782. two friends visited Paris on their return in the autumn 1784. It was now necessary that he should form some ecisive plans for the future, for though his father had left im what was at the time a considerable property, it was ested in Indian stock, which had fallen very greatly in the nterim, while the expenses of travelling, of which he seems o have borne the greater share, had made some inroad into is finances. At the advice therefore of a friend, he applied or the post of teacher to the royal pages, but did not hold longer than about five years. His salary however was con- ed to him as a pension.

1793 he was made one of the masters of the Latin chool, but resigned that situation in the following spring, is motive for accepting it having been chiefly to make such ddition to his income as would enable him to marry a lady to hom he was attached; yet though all preparations had been de, and the day itself fixed, the marriage was broken off by tual consent, and without breach of good understand- between the parties. Thus released from the duty of pro- ng for a family, Samsöe gave up his other engagements, applied himself entirely to literary studies. Besides his andinavian tales, the first of which, 'Frithiof,' had been osed by him while at the university, he commenced a nslation of Cicero's 'Offices,' and another of Garve's work rals. His proficiency in Greek literature, and his ation of Plutarch, suggested to him the idea of writing k on antient history, thrown chiefly into the form of iographies of the most conspicuous personages, connected y succinct narratives of intermediate events. Unfortu- ately he did not execute or even begin it, for nothing of kind was discovered among his manuscripts. He now ed his talent in a different walk of literature, where suc- ss brings with it more sudden and more brilliant popu- ty. The enthusiasm with which his tragedy of 'Dy- cke' (founded on the history of the beautiful mistress of hristian II. and her ambitious mother) was received, would oubtless have led him at once to prosecute that career, and ndeed the plans of two other dramas on national subjects ere found among his papers. But he did not live even to e assured of his triumph, as he died January 24th, 1796, st a week before the first representation of his piece, which k place on the day of his funeral. 'Dyvecke' makes an ch in the annals of the Danish stage: written in prose, divested of those pompous conventionalities which often erve merely to disguise feebleness, this drama captivates by intrinsic interest of dialogue and situations, and by its rcible pathos. It is true that criticism has alleged many efects against it; yet if not perfect, it furnished a model hich did not previously exist in the language; and both on hat account, and as being the only dramatic attempt of he author, it deserves to be estimated by its beauties nd its merits. This tragedy and his Tales form the two volumes of his posthumous pieces, edited by his friend Rahbek.

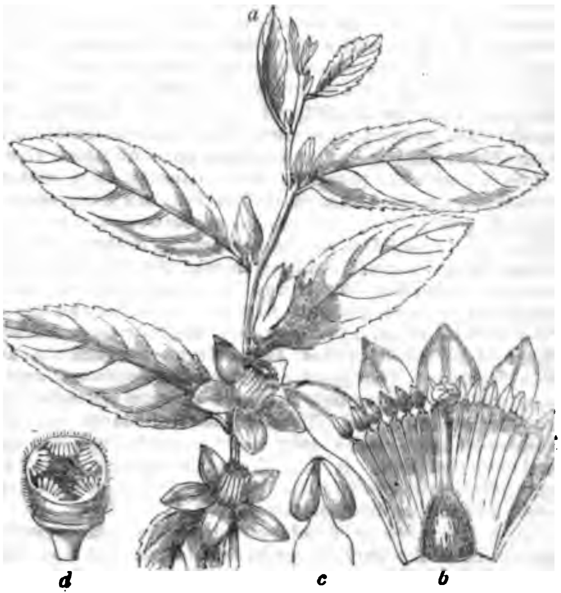
SAMUEL, BOOKS OF, two canonical books of the Old Testament, the first of which contains the history of Israel from the birth of the Prophet Samuel to the death of Saul (B.C. 1171-1055); and the second the history of David's reign for about forty years (B.C. 1055-1017). At this point the history is taken up in the Frst Book of Kings. The Jews and most Christian writers ascribe a portion of these books to Samuel (who, from the nature of their contents, could not have written the whole), and the remainder to the prophets Gad and Nathan, chiefly on the ground of the following passage in 1 *Chron.*, xxix. 29:—'Now the acts of David the king, first and last, behold, they are written in the book of Samuel the seer, and in the book of Nathan the prophet, and in the book of Gad the seer.' The first twenty-four chapters of the first book of Samuel, from Samuel's birth nearly to his death, are ascribed to Samuel himself. As to the remainder, it cannot be exactly determined what part was written by Gad, and what part by Nathan; but it is conjectured that Gad, who was very probably a pupil of Samuel, and a companion of David in his wanderings during the life of Saul (1 *Sam.*, xxii. 5), wrote the history of David, from the death of Samuel to his being made king in Hebron (1 Sam., xxv.; 2 *Sam.*, v.); and that the remaining part of the second book was written by Nathan. These three portions then were collected by Ezra when he formed the canon into one book; for in the Jewish canon the two books of Samuel form only one. Jahn, on the contrary, ascribes the books of Samuel and of Kings to the same author, and places their publication about the forty-fourth year of the Babylonish captivity.

In the Septuagint these books are called the first and second books of Kings, or of the Kingdoms. [KINGS; CHRONICLES.]

(The *Introductions* of Jahn, Eichhorn, Bertholdt, De Wette, and Horne.)

SAMY'DA, a genus of plants of the natural family of Samydeæ. The genus having all the characters of the family to which it belongs, is distinguished by possessing 10-12 stamens, all of which bear anthers; while the stigma is globose. The species consist of small trees or shrubs, found in the hot parts of America, such as the West Indies, Mexico, and Brazil, with a few doubtful species in the East Indies. The branches are sometimes thorny; the leaves alternate, entire, or serrate, with pellucid dots and twin stipules; flower-stalks axillary, single-flowered, solitary or fascicled with white but sometimes purple flowers.

SAMYDA'CEÆ, a natural order of apetalous plants, of uncertain station, and placed by De Candolle amongst polypetalous Exogens. They have three, five, or seven se-



Samyda serrulata.

a, branch with stipulate leaves and flowers; *b*, flower opened, showing the monadelphous stamens and the pistil; *c*, anther with its double cell; *d*, transverse section of ovary showing seeds attached to five parietal placentæ.

pals more or less cohering at the base; stamens perigynous, two, three, or four times as numerous as the sepals, with monadelphous filaments; superior one-celled ovary; indefinite ovules attached to parietal placentæ; capsules with from three to five valves; numerous seeds fixed to the valves; fleshy albumen and a radicle pointing away from the hilum. The leaves are alternate with stipules, marked with round and linear pellucid dots. The apetalous flowers and fruit of this order approximate it to Bixaceæ, and its perigynous stamens and alternate stipulate leaves ally it to Rosaceæ. It is an entirely tropical order, composed of small trees or shrubs. The bark and leaves are slightly astringent. One of the species, Casearia ulmifolia, is used in Brazil as a remedy against the bite of snakes, for which purpose the leaves are applied to the wound, and an infusion of them is taken internally.

SAN BLAS, a town on the western coast of Mexico, in the state of Xalisco, formerly the province of Guadalaxara, is situated on an island formed by two mouths of the Rio Grande de Santiago as it enters the Pacific. It is the seaport of Tepic, and the chief maritime station in Xalisco. It stands about three-quarters of a mile from the shore, on a very remarkable isolated rock, rising abruptly out of a low, swampy, wooded plain or savannah, to the height of 150 feet, inaccessible on three sides, and with a surface of about 500 yards each way; within which limits the town is of course confined. From the plain, which is always more or less under water, rise exhalations and miasmata, which render the town very unhealthy by causing a low fever, besides giving birth to myriads of mosquitoes and sand-flies. During the rainy season, from June to November, the place is perfectly uninhabitable from the torrents of rain, which destroy the houses, and perfectly insulate the rock. At this season, all the inhabitants who can afford it, remove not only themselves but most of their property to Tepic, and the population is in a few days reduced from 3000 to 150.

At the shore is a village called La Playa, inhabited principally by fishermen and those connected with the arsenal, which, though now in a dilapidated state, was once of great importance. A good ropewalk still remains. A small æstuary, the northern branch of the Rio Grande, affords a safe boat-harbour and landing-place, but the anchorage in the roads, which is commanded by two batteries, is much exposed to westerly winds. San Blas affords good supplies of meat, fruit, and vegetables, but the climate is very hot in the summer. 21° 32′ N. lat., 105° 18′ W. long. High-water, full and change, at 9h. 40m.; rise between 6 and 7 feet.

(Captain Hall's *South America;* Captain Beechey's *Voyage to the Pacific; Sailing Directions,* &c.)

SAN FRANCISCO, a port in the Mexican dominions, in the province of New California, on the shores of the North Pacific. It is only on account of its size, and the perfect security which it offers to vessels of any burden, that it has at present any claim to notice, though there can be little doubt that it will ultimately arrive at greater importance from the fertility of its soil and delightful climate. The entrance is narrow, lying between land of considerable elevation, on the southern point of which stands a fort to guard the passage. After running in a westerly direction about six miles, it divides into two branches, one extending 30 miles to the south-east between two ridges of hills with low land at the base reaching to the shores and terminating in small winding creeks; the other taking a northern direction, after about four miles opens out into a capacious basin 10 miles in diameter, and after converging to a second strait, again expands, and is connected with three large rivers, called Jesu Maria, Sacramento, and San Joachim. The greater part of the south-east arm is very shallow, leaving only a narrow channel up the centre, and the landing is bad. There are several islands and some dangerous rocks and shoals, but the anchorages are safe and well sheltered. A bar of sand lies eight miles off the entrance, with only 25 to 30 feet water; and with a high wind a heavy sea breaks over it.

It is not however devoid of interest in other respects, being one of the earliest settlements of the Old Spaniards for the charitable purpose of converting the Indians to Christianity. Their fort or stronghold, called the Presidio, was fixed near the entrance, on the southern shore, about half a mile inland. It is a square enclosure, the sides of which are about 300 yards in length, and were formerly surrounded by a mud wall about 15 feet [illegible] ketry. Against the inner sides o[illegible] dwellings of the settlers, the centre be[illegible] exercise and military evolutions. These [illegible] are [illegible] ruins.

From this primary settlement emanated the five [illegible] ing missions, which were established in vario[illegible] adjacent country under the protection of the [illegible]:—

San Francisco, founded in 1776; Santa [illegible] 1777; San José, 1797; San Francisco Solano, 1823; [illegible] 1827.

As they are nearly similar in appearance [illegible] political organization, they [illegible] all c[illegible] lowing brief description. The [illegible] st c[illegible] the church, around which are [illegible] of the padres, and of the soldiers [illegible] at [illegible] establishment, which are built with [illegible] order and comfort; and at a little distance [illegible] huts of the Indians, placed in squares with great [illegible] It is the business of the Indians, who are under [illegible] lute control of the padres, to cultivate the soil [illegible] care of the herds of sheep and cattle in wh[illegible] wealth of the missions; the hides and tallow [illegible] terey for shipment form their chief source [illegible] Some of the missions possess as many as 10,000 [illegible] cattle.

San Francisco is situated about three miles t[illegible] east of the Presidio, in the midst of a beautiful [illegible] plain. Santa Clara is in an extensive plain not [illegible] head of the southern arm of the port. San [illegible] foot of the hills to the south-east; and the two [illegible] missions are near the shores of the northern a[illegible] of meat and vegetables are plentiful, and [illegible] abounds with game and wild-fowl.

The Presidio is in 37° 48′ N. lat. and 122° 26′ [illegible] High-water at full and change, 10h. 50m.; the [illegible] feet.

(Captain Beechey's *Voyage to the Pacific.*)

SAN MARI'NO, Republic of, is [illegible] territory, consisting chiefly of a steep mountain with [illegible] and covering an area of about 27 square miles. [illegible] in the papal province of Urbino, and abou[illegible] the coast of the Adriatic. The whole popula[illegible] about 7000. The town of San Marino stands o[illegible] of the mountain, the summit of which is crow[illegible] castle with three towers, on which the stand[illegible] public waves. The town is ill built and ill paved; [illegible] are steep, and only practicable for mules and don[illegible] square before the town-house is large, [illegible] fine view of the neighbouring Apennines. [illegible] the Capuchins contains a fine painting repre[illegible] Descent from the Cross. Outside of the to[illegible] suburb; and at the foot of the mountain [illegible] villages, Serravalle, Acquariva, Feglio, [illegible] ants have cultivated every slip of groun[illegible] productive; they make some very good wi[illegible] rear silk-worms, the produce of which c[illegible] of trade. They have also some good ca[illegible] corn from the neighbouring Papal State.

The origin of the republic of San Marino is [illegible] the obscurity of the dark ages. Marinus, a h[illegible] from Dalmatia, is said to have retired to this [illegible] in the fourth century of our æra, and [illegible] church was raised to his memory, and a v[illegible] round the spot. In the tenth century it bec[illegible] town by the name of 'Plebs Santi Marini [illegible] seems to have governed itself as an indep[illegible] pality; and we find in the twelfth century that the [illegible] of San Marino purchased some lands from the [illegible] ing counts of Montefeltro, lords of Urbino. [illegible] wars of the Guelphs and Guibelins, t[illegible] Marino took the part of the latter, [illegible] neighbours of Montefeltro, and as such [illegible] by Innocent IV. Towards the end of the f[illegible] tury, the popes, in consequence of the c[illegible] Rudolph of Habsburg [Papal State], [illegible] rectors to the Romagna, to enforce the su[illegible] papal see over the towns and lords of the [illegible] of these vicars, Hildebrandinus, bishop of A[illegible] year 1291, complained that, with the exce[illegible] of Cesena, no other place in Romagna woul[illegible] tions. This rector appointed a certain The[illegible]

, as his vicar for the district of Montefeltro, in which San
rino was included. The commune of San Marino being
imoned, like the rest, by the vicar, to pay certain dues
fees, refused; and the matter being referred to a learned
ge of Rimini, called Palamede, he decided that the
imunity and men of San Marino were exempt from pay-
it, having been of old independent of all foreign domi-
1, a decision which was confirmed by the vicar Theodo-
in a charter quoted by Delfico in his 'Storia di San
rino.' From that time San Marino has been acknow-
d as an independent state by the popes, although some
—, or rather their legates in the Romagna, have attempted
imes to enforce their authority over that little state, but
attempt has not been persevered in. [ALBERONI.]
Then Bonaparte overthrew the papal government, he
ected the independence of San Marino; and in 1814,
n the pope was reinstated in his dominions, the freedom
he republic was confirmed. The legislative power is in
hands of a great council of 300 anziani, or elders, and
executive consists of a senate of twelve, with a gonfa-
ere, who is changed every three months.

AN REMO, a province of the Sardinian States, forming
of the duchy of Genoa, is bounded on the north by the
itime Alps, which divide it from Piedmont, east by
province of Oneglia, west by the county of Nizza and
principality of Monaco, and south by the Mediter-
an Sea. The country partakes of the general nature
he Riviera, being occupied by offsets from the Alps,
h advance to the sea-shore, and contain between them
ow valleys through which flow several torrents that
generally dry in summer. The lower hills and valleys
the strips of level ground along the coast produce oil,
ges, lemons, and wine. The climate is very temperate
genial, the thermometer seldom falling below the
zing-point. Even date-trees bear fruit in some favour-
spots. (Bertolotti, *Viaggio nella Liguria.*) The popu-
n of the province consists of 56,500 inhabitants, distri-
d among 28 communes.

AN REMO, the chief town, is built on the slope of
ep hill which rises from the sea-coast; the mountains
ing a semicircle around and sheltering it from the
h winds. The lower hills around the town are planted
olive, orange, lemon, fig, almond, and pomegranate trees,
h constitute the principal wealth of the inhabitants.
ie population of the town amounts to 11,000, many of
n are employed as seamen, and enjoy a good reputa-
for honesty and mildness of character. Murders,
h are not uncommon in other districts of this coast, are
iown among the natives of San Remo. Before 1797
Remo had eighty large merchant vessels, most of which,
g pressed by the French into the service for their ex-
ion to Egypt, were lost. The town has now hardly any
r but coasting craft, with which it trades with Marseille
Genoa.

n Remo has a communal college with about 400
ents, and several churches and palaces. The church
' Assunta, or Della Costa, is a fine structure orna-
ted with several columns of alabaster and crowned
handsome dome. The Palace Borea has a gallery of
paintings. The town being formerly deficient in good
r, has been of late years abundantly supplied with it
n aqueduct through the care of its intendente, the
ocato Nota, well known for his dramatic works.

in Remo dates its origin from the ninth century, having
built below a castle on the hill called Castrum S.
iuli, from the name of a bishop of Genoa who was
ed there, and which had been destroyed by the Sara-
. In the twelfth century San Remo was an independ-
community under a nominal allegiance to the German
erors, and in 1170 it made an alliance with Genoa and
a for the mutual protection of their respective shipping
nst the Pisans. In 1199 however San Remo placed
under the allegiance of Genoa, with a reservation of its
l franchises and immunity from arbitrary taxation.
state of things, which was common to most towns of
Riviera, lasted till 1728, when the Genoese having laid
ain duties upon the latter, the people of San Remo took
arms and dismissed the magistrates sent by Genoa.
through the mediation of the Prince of Monaco, the
ier relations between the metropolis and its depend-
es were re-established. In 1753 however, in consequence
sh dissensions, the Genoese sent an armed force to
Remo, built a castle to overawe the town, and deprived the citizens of most of their privileges. Some time after an anonymous writer published 'Mémoires touchant la Superiorité Impériale sur les villes de Gênes et de San Remo,' Ratisbon, 1768, in which, referring to the old suzerainty of the emperors over the whole of the towns of this coast, he said that San Remo could not be bound by allegiance to Genoa, but was merely connected by a convention. The Genoese on their side attempted to prove 'their old high dominion over the whole of Liguria independently of the Empire.' (Accinelli, *Compendio delle Storie di Genova*, vol. ii.)

San Remo has produced some learned men, among others Michel Angelo da San Remo, an Orientalist, who lived in the seventeenth century, and Francesco Maria Gaudio, professor of mathematics in the university of Rome, and the author of several valuable works, especially on hydraulics, who died in 1793.

The only other place of any importance in the province is Ventimiglia, the antient Albium Intemelium, a well-built town of 5700 inhabitants, on the sea-coast at the mouth of the Roia, and a bishop's see. The cathedral, a structure of the middle ages, is said to be built on the remains of a temple of Juno raised by the consul M. Æmilius, after his last victory over the Ligurians, B.C. 187. (Liv., 39, c. 2.) The church of St. Michael is partly built with the remains of a temple dedicated to Castor and Pollux. The town contains several Roman inscriptions. Father Angelico Aprosio, a native of Ventimiglia, and a great philologist and bibliographer of the seventeenth century, bequeathed a considerable library to the Augustine convent in the town, which was plundered of its best works, by the revolutionists of Genoa, it is said, during the French invasion in 1797.

In the eleventh century Ventimiglia had its counts, who afterwards became feudatories of the city of Genoa. This relation was confirmed by the diploma of the emperor Frederic I., dated 1162, which granted to the republic of Genoa the whole Riviera from Monaco to La Spezia, as an imperial fief, saving the rights of the respective counts and marquises. In the thirteenth century Ventimiglia was a subject of dispute between Genoa and the Anjou counts of Provence. In April, 1794, the French, who had already taken possession of Nizza and Monaco, appeared before Ventimiglia. The Genoese governor, not having the means of resistance, could only protest against this violation of a neutral territory. The French then spread along the Riviera, from whence, two years after, they penetrated into the plains of Lombardy.

Between Ventimiglia and San Remo, on a hill above the road, is the village of Perinaldo, the birth-place of the astronomer Domenico Cassini, and his nephew Maraldi, likewise an astronomer, who died at Paris in 1729.

The province of San Remo was for a long time the extreme boundary of the Genoese territory. It has been also considered, geographically speaking, as the western boundary of Italy on this side, the offsets of the Maritime Alps from the group of the Col di Tenda coming close to the sea near Monaco, and closing the passage, whilst the river Roia, which descends from Tenda, flows along their eastern or Italian base. [MONACO.] The country of Nizza, which lies to the west of the mountains, is open on the side of Provence, the Var being rather a conventional than a geographical boundary. In the Antonine Itinerary the boundary between Italy and Gaul is placed at the mountain summit, now called Colle della Turbia, on the road between Villafranca and Monaco, upon which a splendid trophy was raised by the senate to Augustus, in commemoration of his having finally subjected all the Alpine tribes, of which an inscription, given by Pliny (iii. 20), recorded the names. A fragment of the inscription, with the words 'Gentes Alpinæ devictæ,' is seen upon a gate leading to the square of S. Giovanni in the village of Turbia, as well as fragments of columns and other remains. The neighbouring church was built with stones taken from the monument, the massive round tower or body of which, that bore the colossal statue of Augustus, still remained in the seventeenth century, and was used as a castle to defend the pass; but Marshal Villars, in the wars of Louis XIV., blew up the greater part of it. The remaining part is called by the natives 'Il trofeo di Augusto.'

SAN SEBASTIAN. [SEBASTIAN, SAN.]

SANA. [ARABIA.]

SANADON, NOEL-ETIENNE, was born at Rouen, February 16, 1676. Having entered early into the order of Jesuits, he became professor of rhetoric first at Caen, and afterwards at Paris. On the death of Père Ducerceau, he was appointed tutor to the Prince de Conti, through whose influence he became, in 1728, librarian of the Collège de Louis le Grand, which situation he held till his death, October 22, 1733.

The Père Sanadon was possessed of considerable erudition, and was on terms of intimacy with Huet and most of the other learned men of his time. He is the author of a prose translation of Horace, 'Les Poésies d'Horace, disposées suivant l'Ordre chronologique, et traduites en François, avec des Remarques et des Dissertations critiques,' Paris and Amsterdam, 1728, 2 vols. 4to. There is a subsequent edition in 8 vols. 12mo., 1759. This translation is better than that of Dacier, and has smoothed the way for following translators, but it possesses few of the beauties of Horace. Sanadon is the author of a Latin heroic poem, 'Nicanor Moriens,' which contains some pleasing imitations of Theocritus, Anacreon, and other Greek poets. He wrote also some Latin lyric poems, 'Carminum Libri Quatuor,' Paris, 1715, 12mo., and translated the 'Pervigilium Veneris,' Paris, 1728, 12mo. Many of his Latin verses and Latin discourses have been published separately, of which a detail is given in Moreri's 'Dictionnaire Historique,' edition of 1759.

SANCERRE. [Cher.]

SANCHEZ, FRANCISCO, commonly called 'El Brocense,' an eminent classical scholar of the sixteenth century, was born at Las Broças, in the province of Estremadura in Spain, in 1523. He commenced his studies at the university of Valladolid, where he took his degree of bachelor of arts in 1551. From thence he went to Salamanca, where, having been incorporated in the university, he obtained, in 1554, the chair of rhetoric, and also taught Greek and Latin with the highest reputation. Justus Lipsius, Scioppius, and other learned scholars of his time speak in the highest terms of him. The former bestows on him the epithets 'divine' and 'admirable,' and in one of his letters (*Ad Italos et Hispanos*, p. 89) calls him 'Mercurius atque Apollo Hispaniæ.' In 1574 Sanchez took the doctor's degree. He had already edited Persius, Pomponius Mela, the 'Ibis' of Ovidius, Virgil's 'Bucolics,' and Horace's 'Art of Poetry.' He now devoted all his leisure to the composition of the work which gained him most reputation, namely, his 'Minerva; seu de Causis Linguæ Latinæ Commentarius,' which appeared for the first time at Salamanca in 1587, 8vo., and was often reprinted during the sixteenth century, and in more modern times at Amsterdam, 1754, 1761, 8vo., with remarks by Scioppius and numerous annotations by James Voorbroek. [Perizonius] Another edition was published at Utrecht, 1795, with the additions of Everard Scheid. The 'Minerva' is a work in which the rules of Latin syntax are explained by means of quotations from the classic authors. It gained its author great reputation among the learned of his time. In 1593 Sanchez resigned the chair of rhetoric in favour of his son-in-law Bartholomé de Cespedes, and reserved for himself those of Latin and Greek grammar, which he filled till the time of his death. Sanchez died on the 17th January, 1601, at the age of 77, and was buried in the church of the convent of San Francisco. Besides the above-mentioned he wrote the following works:—'Veræ brevisque Grammatices Latinæ Institutiones' (Salamanca, 1587, 8vo), which he subsequently published in Spanish under the title 'Arte para saber Latin' (Sal., 1595, 8vo); 'Grammaticæ Græcæ Compendium' (Salam., 1592, Antw., 1581, 8vo.); 'De Arte Dicendi,' Salam., 1556; 'De Interpretandis Auctoribus, sive de Exercitatione,' Antw., 1582 and 1592; 'Paradoxa,' Antw., 1582, 8vo.; 'Organum Dialecticum et Rhetoricum,' Salam., 1588, 8vo.; 'De Nonnullis Porphyrii aliorumque in Dialectica Erroribus Scholæ Dialecticæ,' Salam., 1588 and 1597. He also published a very learned Commentary on the 'Emblems' of Andrea Alciati, Leyden, 1563; on the 'Sylvæ' of Angelo Politiano, Salam., 1554; on the Poems of Juan de Mena [Mena]; on the works of Garcilaso de la Vega, Salam., 1574. All his minor works, with the exception of the 'Minerva,' were collected and published at Geneva in 1766, 4 vols. 8vo.; prefixed to the first volume is the life of the author by Gregorio Mayans.

Sanchez, Francisco, an eminent physician, who lived at the same time as the subject of the preceding article, has often been mistaken for him. He was born of Jewish parents, but embraced the Christian religion. He di
1632. His works, among which is a valuable Comme
on the Physics of Aristotle, were published after his d
Toulouse, 1636, 4to.

SANCHEZ, THOMAS, a learned theologian, wa
at Cordova in 1550, of noble parents. At the age o
teen he entered the Society of the Jesuits, and in cou
time became director of the noviciate at Granada.
reputation for sanctity and theological learning wa
that he was consulted on difficult cases of conscien
persons from all parts of Spain and Italy. This in
him to write his 'Disputationes de Sancto Matrimonii S
mento,' which he intended as a sort of manual fo
fessors. This work, in which the author displayed
learning, has been the subject of much animadve
(Bayle's *Dict.*, vol. ix., p. 45), owing to the free m
in which the subject is treated. It was first print
Geneva, 1602, folio, and has subsequently gone th
fifteen different editions. He also wrote 'Opus Morale in
cepta Decalogi,' Mad., 1613; and 'Consilia, seu Opu
Moralia,' Lyon, 1634-5. Sanchez died 19th May, 16
Granada, where he was interred with great pomp.

SANCHEZ DE AREVALO, RODRIGO, gen
known as Rodericus Sanctius, a Spanish prelate, muc
mired for his writings on ecclesiastical history and
subjects, was born at Santa Maria de Nieva, in the d
of Segovia, in 1404. After receiving his classical e
tion at the university of Salamanca, and obtaining th
gree of doctor, he entered the church, and was made
cessively archdeacon of Treviño in the diocese of B
dean of Leon, and dean of Seville. About 1440, Jo
king of Castile, wishing to send an ambassador to F
III., chose Sanchez for that purpose. Sanchez suc
so well in the object of his mission, that when Calixt
became pope, he was sent by Henry IV. of Castile t
gratulate his holiness on his accession. In all his emb
Sanchez made Latin harangues to the different prin
whom he was sent. These harangues are still preser
manuscript in the Vatican library. On the access
Paul II., Sanchez, who had been prevailed upon b
predecessor to settle at Rome, was appointed by tha
governor of the castle of St. Angelo, and keeper
jewels and treasures of the Roman church; and in
of time promoted to the bishoprics of Zamora, Ca
and Palencia, which he however governed without qu
Rome. He employed all the time he could spare fr
official duties in composing several works, most of
have never been printed. He died at Rome, Oct. 4th,
and was interred in the church of Santiago dei Spa
He wrote the following works:—'Speculum Vitæ H
&c.,' being a treatise on morals, divided into two bo
which very heavy censure is passed on the clergy,
1468, folio; 'Epistola de Expugnatione Nigropontis,
without date, but probably before the author's
'Compendiosa Historia Hispanica' (Rome, 1470, 4to
dicated to Henry IV. of Castile; this was subseq
reprinted in the collection entitled 'Hispania Illus
by Andrea Schott, vol. i. (Frankfort, 1603). 'Lib
Origine ac Differentia Principatus, &c.,' being a t
wherein the author labours to prove the supremacy
pope over all other sovereigns, Rome, 1521. He also
many more works on different subjects, which are
manuscript in the Vatican library, and the catalogue of
may be seen in Nicolas Antonio, 'Bib.,' vol. i., p. 29

SANCHUNIATHON, a Phœnician writer, who
is not certain: some make him a contemporary of
Semiramis (Euseb., *Præp. Evang.*, i., p. 31; x., p.
and others say that he lived about the time of the
war. (Porphyr. ap. Euseb., l. c.; Suidas, s. v. Σαγχων
His birthplace, according to the general opinion, was
tus, though Athenæus (iii., p. 126, where however th
mon reading is Σουνιαίθων) and Suidas call him a
He was the contemporary of Adonilibnas, a king of
to whom he was engaged as secretary; and it was
request of this king that he wrote his principal work.
mentions the titles of two works of Sanchuniathon
called περὶ τῆς 'Ερμοῦ φυσιολογίας: another Αἰγυπτια
λογία. Athenæus speaks of Φοινικικὰ of Sanchuniatho
'A History of Phœnicia,' which by other antient wri
called Φοινικικὴ ἱστορία, or Φοινίκων θεολογία. (Porphy
Abstin. ab Anim., ii., p. 94; Theodoret, p. 34.) B
three titles probably refer to different portions of the
work, namely, to his History of Phœni

described the religious as well as the profane history of his own country, and also the theology of Egypt. He is said to have derived most of his information from the books of Taaut (Hermes), or from Hierombal, a priest of the god 'Ιευώ (perhaps Jehovah); and if the latter be the same as Jerobaal (Gideon) in the book of *Judges*, Sanchuniathon must have lived in the fourteenth century before the Christian æra. But little confidence can be placed in these and similar conjectures; and some critics have gone so far as to deny the existence of Sanchuniathon.

The original works of Sanchuniathon, which were written in the Phœnician language, are now lost, and even the antients who speak of them do not appear to have been acquainted with them in the original language, but they speak of a Greek translation made by Philo of Byblus, a grammarian who lived during the latter half of the first century of our æra. The original work of Sanchuniathon is said to have consisted of eight books (Porphyr., *De Abstinent.*, ii., p. 94), but the translation of Philo was divided into nine books. (Euseb., *Præp. Evang.*, i., p. 31.) The work of Eusebius just referred to contains a considerable fragment of the history of Sanchuniathon, which gives an account of the gods of the Phœnicians and Egyptians, and till within the last few years this and a few other fragments, as translated by Philo, were the only parts of the work of Sanchuniathon which were known. A very useful edition of these fragments was published at Leipzig, in 1826, by J. C. Orelli, under the title 'Sanchoniathonis Berytii Fragmenta de Cosmogonia et Theologia Phœnicium, Gr. et Lat. recogn. emend. not. sel. Scaligeri, Bocharti, G. J. Vossii, Cumberlandi aliorumque permult. suisque animdv., illustr. J. C. Orelli.' But in the year 1835 a MS. containing the whole of the nine books of Philo's translation of Sanchuniathon was discovered in the convent of Santa Maria de Merinhao, in the province of Entre Douro e Minho in Portugal, by Colonel Pereiro; or according to others, by a German surgeon. The discovery of so important a work created a great sensation throughout Europe, but the opinions of scholars were divided; some declared the work to be a forgery of Philo, while others, and especially Grotefend, exerted their utmost to prove that the work was the real translation of Sanchuniathon made by Philo. The controversy was at the time carried on with great zeal in Germany, and the result was, that at last almost all scholars agreed that the work is spurious. In 1836 Wagenfeld published a German translation of it, with an introductory discourse by Grotefend, under the title 'Sanchuniathon's Urgeschichte der Phœnizier, in einem Auszuge aus der wieder aufgefundenen Handschrift von Philo's vollständ. Uebersetzung nebst Bemerkungen von Fr. Wagenfeld mit einem Vorworte von G. F. Grotefend, mit einem Facsimile,' Hanover, 1836. The year following there appeared 'Sanchuniathonis Historiarum Phœniciæ libros novem, Græce versos à Philone Byblio, edidit Latinaque versione donavit F. Wagenfeld,' Bremæ, 1837, 8vo.; and another German translation, 'Sanchuniathon's Phœnicische Geschichte; nach der Griechischen Bearbeitung des Philo von Byblos ins Deutsche übersetzt, mit einer Vorrede,' Lübeck, 1837, 8vo. Compare, on Sanchuniathon in general, J. A. Fabricius, 'Biblioth. Græc.,' vol. i., p. 222, &c.: and respecting the controversy on the new discovery, C. L. Grotefend, 'Die Sanchuniathonische Streitfrage nach ungedruckten Briefen gewürdigt,' Hanover, 1836, 8vo.; Schmidt, 'Der neuentdeckte Sanchuniathon, ein Briefwechsel,' Altona, 1838, 8vo.; and Movers, 'Die Phönizier,' p. 116, &c.

SANCROFT, WILLIAM, born 1616, died 1693, an eminent and learned prelate of the English church, was born at Fresingfield in Suffolk, and being remarked while at school for his piety and extraordinary powers and attainments, was early destined for the church, and sent to study in Emmanuel College, Cambridge. He was living in the University in 1642, but he soon after lost his fellowship at Emmanuel in consequence of his refusal to take the Solemn League and Covenant.

While in the University, he was a most diligent student. We are not informed what he did from the time when he lost his fellowship to the return of the king, but it was during this period that he produced his work entitled 'Modern Policies and Practices,' a work containing statements of general principles in politics, but intended plainly to bear on the prevalent doctrines and principles of the day. Some part of the time was spent abroad. A little before the king's return, he was in England, and chosen one of the University preachers; in the same year he was collated to the rectory of Houghton-le-Spring, and made a prebendary of the church of Durham. His rise was now rapid: in 1662 he was made master of Emmanuel; in 1663, dean of York; in 1664, dean of St. Paul's; in 1668, archdeacon of Canterbury; and in 1678, archbishop of Canterbury.

While in this high dignity, he performed many useful works. But a change was at hand. King James II. found no countenance from the archbishop in his designs to introduce popery, nor passive acquiescence; and when he had issued his declaration for liberty of conscience, and required the clergy to publish it, Sancroft refused, and, accompanied by six other bishops, presented a petition to the king against the declaration. This petition was treated as a libel, and the seven prelates were committed to the Tower, but on their trial were acquitted. In the same year he was much employed in endeavouring to effect a comprehension of the dissenters and the church. He concurred in the declaration for a free parliament when King James had withdrawn himself, but when the Prince and Princess of Orange were declared king and queen, he, together with several other of the prelates and many of the inferior clergy, refused to acknowledge them as such, and he was in consequence deprived of his dignity.

Tillotson was nominated his successor; and as to Sancroft himself, he did not long survive. Retiring to Fresingfield, the place of his birth, he lived there in a state of great seclusion till his death, which occurred on November 24, 1693. He was buried in the churchyard of that place, under a tomb, the inscription on which, written by himself, is characteristic and remarkable:—'William Sancroft, born in this parish; afterwards, by the providence of God, archbishop of Canterbury; at last, deprived of all which he could not keep with a good conscience, returned hither to end his life, and professeth here, at the foot of his tomb, that as naked he came forth, so naked he must return, the Lord gave, and the Lord hath taken away (as the Lord pleases, so things come to pass), blessed be the name of the Lord.' There is more of it, but this is the most striking part.

SANCTIFICATION, a term in Theology, denoting the highest Christian attainment; the state of those who are perfectly pure and holy, having lost the inclination to vice, and are wholly devoted to virtue and godliness. It is understood to be produced by the special operation of the Holy Ghost, and to ensue upon justification.

SA'NCTIUS. [Sanchez.]

SANCTO'RIUS, the Latinized form of the name of an eminent Italian physician, who was called in his own language Santorio. He was born in 1561, at Capo d' Istria, studied medicine and took his degree at Padua, and then settled at Venice as a practitioner, where he had considerable success. In 1611 he was recalled to Padua, and appointed professor of the theory of medicine in that university. He there commenced a series of observations on insensible perspiration, which have made his name known throughout Europe, even among those who do not belong to the medical profession. 'For the better carrying on these experiments,' says Addison, in the *Spectator*, No. 25, 'he contrived a certain mathematical chair, which was so artificially hung upon springs that it would weigh anything as well as a pair of scales. By this means he discovered how many ounces of his food passed by perspiration, what quantity of it was turned into nourishment, and how much went away by the other channels and distributions of nature.' He continued to lecture at Padua to numerous audiences for thirteen years, until his reputation occasioning his being frequently sent for to Venice by the people of distinction in that city, he resigned his chair, in order to dedicate all his time to medical practice. His resignation was accepted, but the salary continued; and with this testimony of the public esteem he removed and settled finally at Venice, where he died in 1636, aged seventy-five. A marble statue was erected to his honour in the cloister of the Servites, where he was interred; and the College of Physicians at Venice, in return for a legacy which he bequeathed them, annually commemorate him in a laudatory harangue. He was the author of the following works: 1, 'Methodus vitandorum Errorum omnium qui in Arte Medicâ contingunt Libri XV.,' Venet., 1602, fol., and several times reprinted. Haller gives a short analysis of its contents (*Biblioth. Medic. Pract.*, tom. ii., p. 351), says that there is much useful matter in it, and calls it 'magni moment. opus, etsi raro citatur.' 2, 'Commentarius in Artem Medicinalem Galeni,' Venet., 1612, fol. 'Fusissimum opus, says Haller, 'ut tædium lectionis vix feras.' 3, 'Ars de Statica Medicina Sectionibus Aphorismorum Septem comprehensa,' Venet., 1614, 12mo. This is the work by which his name is best known, of which there were numerous editions, and which was translated into several modern languages. The latest edition that the writer has seen quoted is that with a Commentary by A. C Lorry, Paris, 1770, 12mo. There is a French translation by Le Breton, Paris, 1722, 8vo., and by Pierre Noguez, 1725, 12mo., 2 vols.; an Italian one be F. Chiori, Venice, 1743; a German one, Bremen, 1736, 8vo.; and an English one, Lond., 1676, 12mo., and another by Dr. Quincy, third edit., Lond., 1723, 8vo. It contains the results of a long series of observations made upon the weight of his own body, and the external causes which influenced its increase or diminution. He treats especially of insensible perspiration, on the due amount of which he makes health and disease depend. There is much curious and valuable matter in the work, though the advances of modern science have thrown some doubt upon the infallibility of some of his aphorisms. He unquestionably conferred a benefit on medical science by directing the observations of medical men to the functions of the skin; but unfortunately the doctrines were extended much too far; and coinciding with the mechanical principles which were coming into vogue after the discovery of the circulation of the blood, as well as with the chemical notions which were not yet exploded, they contributed to complete the establishment of the *humoral pathology*, under the shackles of which the practice of medicine continued almost to our own times. 4, 'Commentarius in Primum Fen Primi Libri Canonis Avicennæ,' Venet., 1626, fol. 'Memorabile opus,' says Haller, 'plenumque propriorum inventorum et cogitationum apud auctorem primum natarum.' In it he describes an instrument that he had invented for measuring the force of the pulse, and several new instruments of surgery. He was also the first physician who attempted to measure by the thermometer (then newly invented) the heat of the skin in different diseases, and at different periods of the same disease. 5, 'Commentarius in Primam Sectionem Aphorismorum Hippocratis,' Venet., 1629, 8vo. A work not of much value. 6, 'Liber de Remediorum Inventione,' Venet., 1629, 8vo., contains nothing remarkable except the account of some post mortem examinations. A letter by Sanctorius, 'De Calculo,' is inserted in Jo. van Beverwyck's 'De Calculo Renum et Vesicæ Liber Singularis, cum Epistolis et Consultationibus Magnorum Virorum,' Lugd. Bat., 1638, 12mo. All his works were collected and published in four volumes, 4to., Venet., 1660.

SANCTUARY, in English law, a consecrated place which gives protection to a criminal taking refuge there. The word also signifies the privilege of sanctuary, which was granted by the king for the protection of the life of an offender. Among the Saxons the privilege of sanctuary was regulated by law, and all persons were prohibited from violating it by taking away or molesting the offender, who had a right to remain in sanctuary thirty days, after which he was to be delivered safe to his relations. The institution was probably beneficial in those times. It took away from parties the opportunity of avenging their wrongs upon the offender, and gave him time to collect the mulct, which was then the legal penalty for many crimes. The same custom prevailed after the Conquest; but under the dominion of the Normans there appear early to have existed two kinds of sanctuary, one general, which belonged to every church, and another peculiar, which commenced and had its force in a grant by charter from the king. This peculiar sanctuary could not be claimed by prescription only, and it was also necessary that it should be supported by usage within legal memory, and allowance before the justices in eyre. These two kinds differed from each other with respect to some of their privileges. The general sanctuary afforded a refuge to those only who had been guilty of capital felonies. On reaching it, the felon was bound to declare that he had committed felony, and came to save his life. If he neglected to do this, he might immediately be dragged from the place. After this declaration, he had the option, within forty days, either of surrendering himself to justice, or of stating before the coroner the particular circumstances of his offence, and taking the oath of abjuration, by which he swore forthwith to leave England, and never to return without the king's permission. The consequence of abjuration was the attainder of his blood, and the consequent forfeiture of all his goods and chattels. After taking the oath, a port [illegible] him by which to quit the kingdom, and a certain [illegible] allowed for this purpose. It seems however that if [illegible] refused to leave the sanctuary, the lay officers had au[illegible]thority to remove him; and in case the spiritual a[illegible] declined to act, there were no means of removing [illegible]cept by starving him out. If during the forty days [illegible] the oath of abjuration, and during his journey for [illegible] pose of quitting the realm, he was legally proceeded [illegible] he might plead his privilege of sanctuary to an [illegible] indictment. A peculiar sanctuary might, if such pri[illegible] was granted by the charter, afford a place of refuge even [illegible] those who had committed high or petty treason; and a party escaping thither might, if he chose, remain u[illegible]turbed for life. He still however had the option to [illegible] the oath of abjuration and quit the realm. San[illegible] seems in neither case to have been allowed as a prot[illegible] to those who escaped from the sheriff after bei[illegible] vered to him for the purpose of execution. It appears also that it was not allowed in cases of sacrilege. During [illegible] latter part of the reign of Henry VIII., at the time w[illegible] the religious houses were dissolved, several statutes w[illegible] passed (26 Henry VIII., c. 13; 27 Henry VIII., c. 19; [illegible] Henry VIII., c. 12), which regulated, limited, and pa[illegible] abolished the privilege of sanctuary, both as regards [illegible] number and classes of criminals entitled to it, and also [illegible] places possessing the privilege. Finally, by 21 J[illegible] c. 28, s. 7, it was enacted that no sanctuary or priv[illegible] sanctuary should thereafter be admitted or allowed [illegible] case. [ASYLUM.]

(Reeves's *History of the English Law*; Comyn's *Digest*, tit. 'Abjuration;' 4 Bl., *Com.*)

SAND. A mass of any comminuted [illegible] is in popular language called sand; but the most abun[illegible]gredient in the extensive sands of the deserts, sea-shores, river-banks, and soil, is granular quartz or flint.

Little attention has been paid by geologists to this abundant covering of the earth's surface. Most of the sa[illegible] which we observe are the ruins of disintegrated rocks; white, grey, black, according to the rocks from which [illegible] were derived. On examining these rocks themselves we find them composed of grains of such sand, not cryst[illegible] grains, but worn and rounded on their surfaces like pebbles. The parts of these solid rocks then [illegible] existed as mere loose sand, and we seem to return [illegible] to the point of departure. The *origin* of sand is however seen in volcanic dust and ashes—in the disintegration [illegible] granitic, porphyritic, and other pyrogenous rocks; the [illegible]gation of them is easily understood by examining m[illegible] grit, new red-sandstone, or the grès-de-Fontainebleau: and the disintegration of sandstones is too common a phenomenon in English Gothic buildings.

Soil often contains sand, though the subjacent strata be wholly calcareous or finely argillaceous. This is a phenomenon of the same order as the accumulation of detritus (boulders, gravel, clay, &c.) in situations far from the na[illegible]tive place of such materials. It proves that the surface [illegible] been traversed by currents of water; and there can be little doubt in the mind of an observing agriculturist, that these washings of the earth's surface, by mixing materials of different qualities, have been in many cases the cause of the fertility of soils.

Some sands impregnated with oxide of iron (and [illegible] often blackened or rendered ochraceous) and others w[illegible] are nearly white, are very sterile; others of a grey or green, brown, or redder hue, are often fertile. The latter almost always contain argillaceous ingredients (often a proportion of felspar), and probably it is in a great degree to the presence of potash in the felspar or the clay that their superiority is owing. [MANURE.]

SAND GROUSE. [TETRAONIDÆ.]

SAND MARTIN. [SWALLOWS.]

SANDAL WOOD. [SANTALACEÆ; SANTALUM.]

SANDAL-WOOD, RED, or Red Saunders Wood [illegible] Commerce. [PTEROCARPUS.]

SANDARAC (incorrectly called a *gum*, b[illegible]gether destitute of that principle, and consisting [illegible]ture of two different kinds of resin and a little vola[illegible] is a secretion from the Callitris quadrivalvis (Thuya [illegible]culata, Desf.), a tree of enormous size, native of the [illegible] part of the province of Temme in the kingdom of Marocco, and there called Arar. (Jackson, *Travels in Marocco*, p. 78.) It exudes spontaneously from the bark, and [illegible] ted on the surface. It occurs in small, irregular, but rather elongated, seldom perfectly round tears, or in masses run together, which are rarely of any considerable size, of a light yellow colour, sometimes verging to brownish, of a dull hue externally, generally covered with powder, but when this is removed, semitransparent. It breaks easily with a conchoidal fracture and vitreous lustre. The powder is white, and forms the substance called *pounce*. By chewing it forms a fine powder, which does not agglutinate, and has a faint balsamic taste. At ordinary temperatures it is without odour, but by the application of heat it easily melts and diffuses a strong though not unpleasant odour, resembling that of juniper or mastic, but not so agreeable as the latter. It is easily ignited. It is soluble to the extent of four-fifths in cold alcohol, and the insoluble residuum is easily soluble in æther, or, slowly and with difficulty, in boiling turpentine. The portion insoluble in alcohol is termed *Sandaracin*.

Sandarac is used for the preparation of varnishes, also occasionally for incense or pastilles, plasters, and ointments. The powder is rubbed on parchment to render it fit to be written on. Sandarac is sometimes used to adulterate mastic; and on the other hand, a resin obtained from the Juniperus communis, and another from J. Oxycedrus, are employed as a substitute for the genuine sandarac. In Sweden, lumps of resin which are found under ants' nests below the juniper bushes are called Sandarac. The resin of the Pinus Dammara (Agathis loranthifolia, Salisb.) is called French Sandarac in commerce. Sandarac must not be confounded with Orpiment.

SANDBACH. [CHESHIRE.]

SANDBY, PAUL, an English artist of very great merit and deserved reputation, was born at Nottingham in the year 1732. At the early age of fourteen he came to London, and obtained an introduction to the drawing-room at the Tower, where he had studied about two years, when the Duke of Cumberland, wishing to have a survey of the north and west parts of the Highlands of Scotland, Sandby was employed as draughtsman under Mr. David Watson. Though his proper occupation was the drawing of plans, he devoted his leisure hours to making numerous sketches of the fine scenery of that romantic country. From these sketches he made some small etchings, which were published by Ryland and Bryce. About 1752, after his return from the Highlands, he passed some time at Windsor, where he made drawings of the beautiful scenery of Windsor and Eton. These drawings were much admired, and were purchased by Sir Joseph Banks, who soon afterwards invited him to accompany him on a tour in Wales. Here he was employed by Sir Watkin Williams Wynne to take views of the picturesque scenery of the principality. These he afterwards engraved in aqua-tinta, in imitation of drawings, with a degree of perfection to which that style of engraving had never before attained.

On the institution of the Royal Academy in 1768, Mr. Sandby was chosen one of the original members, and in the same year received the appointment of head drawing-master to the Royal Military Academy at Woolwich; an office which he held with credit to himself and great advantage to the academy till his death.

His industry was as remarkable as his genius, and the number of his drawings which are contained in the cabinets of amateurs is immense. It appears that he sometimes painted in oil, but none of his performances of that kind are known to the public.

SANDEC (pronounced Sandetz), one of the circles of Austrian Galicia, is 1400 square miles in extent, and has 220,000 inhabitants. It is bounded on the north by the circle of Bochnia, on the east by that of Yaslo, on the north-west by that of Wadowice, and on the south and south-west by Hungary. The southern part is entirely covered by the Carpathian Mountains. There are many sandy tracts. The soil in some parts is stony, and only a few spots are fertile. The Dunajetz rises in the south-west corner of the circle, but is not navigable till it has been joined above Old Sandec by the Poprad, a more considerable stream, which comes from Hungary, traverses the whole circle, and receives all the smaller streams. The inhabitants are industrious, and cultivate the soil with great care and industry. They have also a pretty numerous breed of cattle. The abundance of wood enables them to maintain many glasshouses, and they manufacture great quantities of yarn and linen.

NEW SANDEC, the chief town of the circle, is situated on an eminence on the right bank of the rapid Dunajetz, in a wide and fertile plain bounded by mountains rising like an amphitheatre behind each other. It has a gymnasium, founded in 1818, a district school, and the public offices of the circle. The number of inhabitants is nearly 5000, of whom one third are Jews. OLD SANDEC, about 6 miles to the north, consisting chiefly of wooden houses, has 3000 Christian inhabitants, a convent of nuns of the order of St. Clarissa, a female school for the higher classes, and a gymnasium. It is also the residence of a vicar-general for the three western circles, who has a chapter and a consistory, and exercises episcopal functions since the suppression of the bishopric of Tarnow.

SANDEMANIANS, one of the minor sects, consisting of persons who profess to be followers of Robert Sandeman, a native of Perth, born in 1718. They are however really an offset from the Glasites of Scotland, a body of religionists followers of Mr. John Glas, a minister in the Presbyterian church, who was removed from his office, on account of certain peculiarities of religious opinion, in the year 1728. Mr. Sandeman married Catherine Glas, daughter, we believe, to John Glas, and entered into all his peculiarities. In 1757 he published his Letters on the 'Theron and Aspasia' of Mr. James Hervey, in which the peculiarities of the Glasite system are exhibited in a popular manner. In 1758 he began a correspondence with Mr. Samuel Pike, an Independent minister of note in London, who adopted his views, and in 1760 he removed to London, where he preached in various places, and attracted much notice. He did not however remain long in London, for in 1764 he removed to the American Colonies, where he continued till his death.

The leading doctrine of the sect is thus expressed in the epitaph on Mr. Sandeman's tomb at Danbury in New England:—'Here lies, until the resurrection, the body of Robert Sandeman, who, in the face of continual opposition from all sorts of men, long and boldly contended for the antient faith, that the bare death of Jesus Christ, without a deed or thought on the part of man, is sufficient to present the chief of sinners spotless before God.'

The Sandemanians in London met first for public worship at the hall of the Glovers' Company, afterwards at an old meeting-house of the Quakers in Bull and Mouth Street, and from 1778 at a chapel in Paul's Alley, Barbican.

The best account which has been given of this sect is to be found in 'The History and Antiquities of the Dissenting Churches in London,' by Walter Wilson, in four volumes 8vo. (vol. iii., p. 261-276). After giving a more detailed account of the faith of this body of persons, he proceeds 'to unfold some of those practices by which they are distinguished from other Christians: these are, their weekly administration of the Lord's supper; their love-feasts, of which every member is not only allowed but required to partake, and which consist in dining either in the vestry of their meeting house or at each other's houses in the interval between the morning and afternoon services; their kiss of charity at the admission of a new member, and at other times when they deem it necessary and proper; their weekly collections before the Lord's supper, for the support of the poor and defraying other expenses; mutual exhortation; abstinence from blood and things strangled; washing each other's feet, when, as a deed of mercy, it might be an expression of love; community of goods, by which any one is to consider the whole of his property liable to the calls of the poor and of the church; and the unlawfulness of laying up treasures upon earth, by setting them apart for any distant, future, and uncertain use. Agreeably to this, they do not allow of putting out money to interest. They allow of public and private diversions, so far as they are not connected with circumstances really sinful; and, apprehending a lot to be a thing sacred, they disapprove of lotteries and games of chance.' Such is Mr. Wilson's account.

The sect is said to be more numerous in America than in England.

SANDERLING. [SCOLOPACIDÆ.]

SANDGATE. [KENT.]

SANDOMIR. [POLAND.]

SANDO'RICUM, a genus of plants of the natural family of Meliaceæ, which is named from a change in one of its eastern names, Suntoor or Sundoor. The genus contains only a single species, found in the hot parts of Asia, and is characterised by having the calyx 5-toothed. Petals 5. Stamens 10, joined into a tube, which is 10-toothed, and bears the anthers inside. Stigmas 5-bifid. The drupe contains 5 ovate compressed nuts, which are 2-valved at the base, and 1-seeded. *S. indicum*, the only species, is an elegant tree of considerable size, which is found in the Molucca and Philippine Islands, as well as in the southern parts of India. The leaves are alternate and trifoliolate, leaflets entire, panicles axillary, with the flowers crowded on the short partial peduncles. The fruit is acid, and sufficiently agreeable to be mixed with syrups to make cooling drinks: its root is bitter, and used in medicine in bowel complaints. It is sometimes called false mangosteen, from some resemblance to its fruit, and also Indian sandal-wood.

SANDOVA'L, FRAY PRUDENCIO DE, an eminent Spanish historian, was born at Valladolid, others say at Monterey in the province of Galicia, about 1560. His parents having educated him for the church, he took the monastic orders at the Benedictine convent of Santa Maria la Real de Naxera, where he passed several years, devoting all his attention to the study of the civil and ecclesiastical antiquities of Spain. Having gained some reputation by his writings, he was made abbot of San Isidro de Guengua at Valladolid, and soon after appointed historiographer to Philip III. This monarch charged him with the continuation of the 'Cronica General' of Ambrosio de Morales [MORALES], which Sandoval published under the title of 'Historia de los Reyes de Castilla y de Leon.' Other historical works which he published at the same time, attracted the notice of Philip, and he was rewarded by him with the bishopric of Tuy in Galicia, which Sandoval held until he was translated to that of Pamplona in 1612. Sandoval's whole life was spent in visiting the public archives and principal libraries in Spain, where he found many interesting documents. He died at Pamplona, March 17, 1621, at the age of sixty-one. Besides the above, Sandoval wrote several other works on the history and antiquities of his native country, among which the following are the most deserving of notice:—'Cronica del Inclyto Emperador de España Don Alonso VII.,' Mad. 1600, fol.: this is a chronicle of Alfonso VII., king of Castile and Leon, surnamed 'the Emperor.' 'Historia de la Vida y Hechos del Emperador Carlos V.,' in two parts (Valladolid, 1604, fol.), Pamplona, 1614, and Antw., 1681. This work is greatly praised by Robertson, who used it for his 'History of Charles V.' There are two old English translations, or rather abridgments, of it; one by James Wadsworth, under the title of 'The Civil Wars of Spain,' Lond., 1652, fol.; the other by Capt. John Stevens, 'History of Charles V.,' Lond., 1703, 8vo. 'Antiguedad de la Ciudad y Iglesia Cathedral de Tuy,' Braga, 1620, 4to. 'Catalogo de los Obispos de Pamplona,' Pamp., 1604, fol. 'Regla e Instruccion de San Leandro,' Valladolid, 1604, 8vo. He also edited the chronicles of Isidorus Pacensis, Sebastianus Salmanticensis, Sampirus, bishop of Astorga, and Pelagius Ovetensis, all writers of the twelfth century, the whole being published in a volume under the title of 'Las Cronicas de los Quatro Obispos,' Pampl., 1615 and 1634, fol. Sandoval is justly considered by Spaniards one of their best historians. His style is clear and unaffected, and his erudition vast, though, like most writers of his time, he is occasionally led away by a strong spirit of nationality.

SANDPIPER. [SCOLOPACIDÆ.]

SANDSTONE. The aggregation of sands into stone takes place by the entire confluence of the grains (through a sort of semifusion), as in quartz rock, and in common gritstones which adjoin trap-dykes or great faults: by mere coherence of grains, as in many white sandstones: by interposition of finer particles of carbonate of lime, clay, oxide of iron, &c., as in the sandstones of coal tracts; or by a complete infiltration of sub-crystallized carbonate of lime, as in some of the Hastings sandstones, grès de-Fontainbleau, &c. In regard to structure, we have laminar sandstones, the laminæ plane, waved, or even slightly concentric: and freestones, in which, without any real lamination, the grains are arranged unsymmetrically and indiscriminately, so as to present in the mass equal resistances in every direction. The laminar sandstones can be split: the freestones may be worked with ease in any direction. Sandstones, in popular language, occupy a station intermediate between sand and gritstone; but there is little consistency in the geological application of the term.

SANDRART, JOACHIM VON, well known as a painter and engraver, but more celebrated for his writings on the arts, was born at Frankfort on the Main, in 1606. Having received a good general education, he devoted himself to the study of the arts, and was first instructed in engraving by Theodore de Bry and Matthew M[illegible] only fifteen years of age, he went to [illegible] where he was for some time instructed in engraving by [illegible] Sadeler, who however advised him to apply to painting, which he judged to be better suited to his genius. He accordingly [illegible] Utrecht, where he became a pupil of Gerhard Hon[illegible] Under this able teacher he made great progress, so as [illegible] shortly able to assist his master in many of his [illegible]tant works.

Descamps affirms that when Honthorst was [illegible]ited to England by Charles I., he engaged Sandrart to [illegible] him, that the king bespoke many pictures of [illegible] he copied several portraits by Holbein for the Earl [illegible]del, and that he remained in England till 1627 (in which case he would have been only twenty-one years of age) when he went to Venice. Pilkington's Dictionary, ed. by Fuseli (1818), gives a similar account. But Bryan [illegible] says 'there appears to be very little authority [illegible] count. No picture of Sandrart's is mentioned [illegible] Charles's collection, and what renders the story of his having been in England more improbable, is that he takes no notice of it himself in his Life of Honthorst, though he mentions that artist's journey to England, and gives an account of his works here.' We may add that Dr. Waagen does [illegible]tion a single picture by Sandrart among the numerous [illegible]lish collections which he describes. It is certain [illegible] spent several years in Italy. At Venice he copied [illegible] pictures of Titian and Paul Veronese, and at Rome was [illegible] employed by Cardinal Barberini and Prince Giustiniani. After a long residence in Italy he returned to Frankfort, and executed many considerable works for the emperor Ferdinand, and for Maximilian, duke of Bavaria. He passed the latter years of his life at Nürnberg, where he died in 1683, aged 77 years. At Nürnberg he published several works, particularly his Lives of the Painters, under the title of 'Academia Artis Pictoriæ.'

SANDWICH, a municipal and parliamentary borough in the county of Kent, about 67½ miles from the General Post-office, London, through Rochester and Canterbury. It was early a place of importance, and an original [illegible] of the Cinque Ports. [CINQUE PORTS.] It probably [illegible] out of the decay of the Roman Ritupæ. [KENT, vol. [illegible] p. 191, col. 2.] The name Sondwic occurs as early as A.D. 665. (Boys's *Hist. of Sandwich*, p. 833.) The Danes were defeated here, A.D. 851 or 852, by Athelstan, son of Ethelwulf. They were at Sandwich again in A.D. 993 or 994, and in A.D. 1006 or 1007; the Anglo Saxon fleet was at Sandwich in A.D. 1008, and the Danish fleet in A.D. 1013 and 1014. Canute landed here in A.D. 1016. It is again mentioned as a place of rendezvous for naval armaments in the time of Edward the Confessor, in whose reign the town had [illegible] inhabited houses. At the time of the Domesday Survey there were 383. At this time the port belonged to the archbishop of Canterbury and the monks of Christchurch, Canterbury. Part of the rent received by the archbishop consisted of 40,000 herrings for the monks' food. In the reigns of Edward I. and III. the archbishop and monks gave up Sandwich to the crown, in exchange for lands granted elsewhere. In the time of Henry III. the town was burnt by the French. In the French wars of Edward III. it is mentioned as a place of rendezvous or of landing. In the reign of Henry VI. the French took and plundered the town three times. To prevent similar disasters, Edward IV. renewed the fortifications; and in following reigns attempts were proposed or made to preserve or improve the harbour, which was beginning to decay from the accumulation of sand. This choking up of the harbour led to the decline of the town, which was however revived by the settlement of the Flemish refugees, in the reign of Elizabeth, and the introduction by them of the manufacture of baize and other woollens. The same emigrants cultivated the lands round the town for vegetables, flax, and canary seed.

The town stands in the marsh lands which border on the Isle of Thanet, on the south side of the Stour, near its m[illegible] in Pegwel Bay. It is irregularly and inconveniently laid out; the streets and lanes are paved and lighted, but [illegible] very narrow. The antient municipal limits comprehend the three parishes of St. Mary, St. Peter, and St. Clement, [illegible] the extra-parochial district of St. Bartholomew, and the town is partly in each. The area comprehended in the limits is 1960 acres; the population, in 1831, was as follows:—St. Mary's parish, 952; St. Peter's, 1220; St. Clement's, 912; district of St. Bartholomew, 52: total, 3[illegible]

The parishes of Deal and Walmer, adjacent to Sandwich, and the villes of Ramsgate and Sarr, in the Isle of Thanet, are in the jurisdiction of the Cinque Port of Sandwich; in the parish of Deal the corporation of Sandwich has concurrent jurisdiction with that of Deal, but this jurisdiction is only partially exercised. A part of the town wall is standing, and one of the gates, Fishergate, on the north side of the town, towards the bridge, which is a stone structure, with a swing-bridge in the middle, to admit the passage of vessels. St. Clement's church is a massive building, consisting of a nave and two aisles, a chancel, and a tower rising above the centre of the church. This tower is of Norman architecture, supported by four semicircular arches with massive piers, and is by far the most antient part of the edifice: it is built of Caen stone. The rest of the building, which is of later date, is built of flint boulders from the shore, sandstone, and Caen stone, probably from the ruins of he more antient Norman church. There are an antient octagonal font and some wooden stalls. St. Peter's church consisted originally of a nave, with two aisles and a chancel, but the fall of the steeple, in A.D. 1661, demolished the south aisle, which has never been rebuilt. The church appears to have been built of Caen stone, well quared and neatly joined: some portions built in this way till remain, but the remainder is built of fragments of the lder structure, mixed with sandstone, Kentish rag, and lints from the shore; the upper part of the tower s of brick. St. Mary's has a nave, with north aisle and chancel: it was rebuilt after the greater part of the hurch had been beaten down by the fall of the steeple, .D. 1667, but includes some parts of the more anient structure. The steeple was built A.D. 1718, upon he south porch, and is of brick, with the upper part of wood. On the south side of the town is the hospital of St. Bartholomew, a charitable foundation of great antiquity. The chapel is a small neat building, of antient date. The Guildhall is of the date of Elizabeth; the gaol, which is lean, airy, and well-arranged, was built about ten years ince. The Wesleyans and Independents have each a place f worship. There are a free grammar-school, founded in he time of Elizabeth, and some almshouses.

The business of the place consists chiefly in tanning ather and in sorting wool. Only small vessels can come p to the town. Some timber and iron are brought from he north of Europe; and corn, malt, flour, seeds, hops, uit, and wool are shipped, chiefly coastwise. The market-ays are Wednesday and Saturday; the latter is a large orn-market, and there is a large cattle-market once a fortnight. There is a yearly fair.

The corporation, under the Municipal Reform Act, consts of four aldermen and twelve councillors. The munipal boundaries were not altered; and the borough was ot to have a commission of the peace except on petition nd grant. Sandwich returned two members to parliament om the forty-second year of Edward III. By the Boundary ct the parishes of Deal and Walmer were, for parliaentary purposes, added to it. The population of the rliamentary borough, thus enlarged, was, in 1831, 12,183; e number of voters on the register, in 1834-5, was 934; 1835-6, 841, beside those in Walmer, who were not inuded in the last return.

The living of St. Peter's is a rectory, of the clear yearly lue of 144*l.*, with a glebe-house; those of St. Clement and Mary are vicarages, of the clear yearly value of 310*l.* d 117*l.* respectively; there is a glebe-house to St. Mary. ll are in the diocese and archdeaconry of Canterbury.

There were in the three parishes, in 1833, two infant or me schools, with 14 boys and 18 girls; one boarding-ool, with 21 girls; a national school, with 90 boys and girls, supported partly by endowment and subscription, rtly by the payments of the children; and eight other y-schools, with 134 boys and 112 girls. There was an owment for a grammar-school, but there were no chilen in it. There were three Sunday-schools, with 75 boys d 112 girls.

SANDWICH ISLANDS are a group of islands uated in the northern part of the Pacific, between 18° ′ and 22° 20′ N. lat., and between 154° 50′ and 160° 40′ long. They extend within these limits in a slightly rved line from south east to north-west, and are thirteen number; eight of them are of moderate size, and the er five small. The larger islands are Hawaïi, Mauï, haurawe, Ranaï, Morokaï, Oahu, Tauai, and Nihau.

Hawaïi, formerly called *Owhyhee*, the most south-eastern island, is the largest of the whole group, and indeed twice as large as all the rest together. In form it approaches to a triangle, and is nearly 100 miles long from south to north, and nearly 80 miles wide in the broadest part. The surface is said to be 4000 square miles, but it probably does not fall much short of 5000. It is therefore somewhat more than 1000 square miles smaller than Yorkshire, about the size of the state of Connecticut, and above 1600 square miles larger than the island of Corsica. The interior is occupied by a table-land 8000 feet above the sea-level, and almost entirely unknown, as it has never been visited by Europeans, and not much more by the natives, there being no road over it from one side of the island to the other. According to the scanty information collected from the natives by Ellis, it is chiefly covered with lava and ashes, but in some places overgrown with wanti-trees, or paper-mulberry-trees. The edge of this table-land towards the east is about 25 miles from the sea, but on the west and south it seems to approach the shore within 20 miles. Near these edges are situated three volcanoes, of which the highest, Mouna Kea, is near the eastern declivity of the table-land. Its summit attains an elevation of 13,587 feet above the sea-level, but it is extinct. Near the south-western corner of the table-land is the Mouna Roa, whose summit is 13,175 feet above the sea. No eruption of this mountain is recorded, but it does not appear to be extinct. The present crater has a circumference of about six miles and a quarter, and the antient orifice is not less than 24 miles round. On the western edge of the table-land is the volcano called Mouna Huararaï, whose elevation has not been determined, but it is estimated at 10,000 feet. It is still active, the last eruption having taken place in 1800. On the table-land there are many other conical peaks, which are evidently extinct volcanoes. But the most remarkable volcano is that of Kirauea, which is at no great distance from the eastern declivity of Mouna Roa, but properly on the southern declivity of the table-land. This volcano is not, like other volcanoes, a conical mountain, but a depression below the general surface of the slope, of somewhat irregular shape, with almost perpendicular sides. The elevation of the slope where this vast pit occurs, is 3873 feet above the sea-level. The steep descent to the crater is interrupted by two narrow plains or ledges, one of which is 715 feet below the upper surface, and the other about 100 feet. The surface of the volcanic lakes is 43 feet below the last-mentioned ledge. The crater contains two lakes, the smaller of which is nearly of a circular form, and 319 yards across; the larger is 1190 yards long, and in one part about 700 yards wide. These lakes are vast caldrons of lava in a state of furious ebullition, sometimes spouting up to the height of 20 and even 70 feet. The fiery waves run with a steady current at the rate of nearly three miles and a quarter per hour southward, enter a wide abyss, and fall into the sea in 19° 11′ 51″ N. lat. All the country round this volcano is covered with lava. To the east of this volcano, and at the distance of 370 yards, is a perfectly circular volcano of much smaller dimensions. On the neck which separates these two volcanoes the ground opened in 1832, and discharged liquid lava for three days into both craters, a large part of which was thus filled up. The volcano of Kirauea has from time immemorial been prodigiously active, though it has not within the memory of living men been known to overflow, except in 1787, when a dreadful eruption took place, and lasted seven days.

From the edges of the table-land, which are about 8000 or 9000 feet high, the country has a gradual slope to the sea. The higher part of this slope, from the table-land to the distance of about four miles from the shore, where it sinks down to 1500 feet, is covered with dense forests, consisting chiefly of several species of acacia, which attain a great size, and of which the canoes of the natives are made. The underwood is tree-fern, from four to forty feet high, and clothed to the top with an almost endless variety of climbing plants. The soil on which these woods grow lies on lava, which frequently rises above it. This woody region occupies a tract from 15 to 20 miles wide, and is surrounded by a country similar to some parts of England, the surface being an alternation of groves and clumps of trees with cultivated grounds. The most fertile tract perhaps in the whole group of the Sandwich Islands is that which lies west of Byron's Bay, or Waiakea, and extends towards the base of the volcano of Mouna Kea. It is thickly inhabited and well cultivated; but nearly contiguous to it on the south, and adjacent to the volcano of Kirauea, is a desert of rugged lava, extending 40 miles along the shores, where no cultivation occurs, and which is only inhabited by fishermen. Along the north-eastern coast, nearly from Byron Bay to Cape Upolu, the most northern point of the island, the coast is bold and steep, and intersected by numerous valleys and ravines, in which, as well as on the declivities, the huts of the natives are built. Though the rocks, on which a thin soil rests, are volcanic, consisting generally of a brown resinous lava, it is rather a fertile tract, with abundant herbage. The western coast of the island is of a similar description, except that it comes down to the sea with a gentle slope.

Byron Bay, on the eastern shore, is a spacious harbour, which lies south and north: it is protected from the north-east wind by a coral reef, half a mile wide, which extends from the eastern point in a north-western direction two-thirds across the bay, leaving a channel three-quarters of a mile wide, and from ten to eleven fathoms deep. It is the best harbour and the only one on the eastern shore of the island. On the western coast are the harbours of Towaihae and Karakakoa. The first is not safe in winter, and in summer fresh water can only be obtained on this side of the island, at a distance of from four to six miles. Karakakoa is not safe, on account of its great depth, so that vessels are obliged to anchor too near to a rocky shore. In this harbour Cook was killed, in 1779.

The population of Hawaii is stated to be 81,000. The abodes of the inhabitants in no part extend more than four miles from the shore.

Mauï, or *Mowee*, is situated north-west of Hawaii, and separated from it by a strait 24 miles wide. It extends from east-south-east to west-north-west, 48 miles, and is, in the widest part, 29 miles across. It is composed of two masses of rock, surrounded by a narrow tract of low land, and united by a low and sandy isthmus which is nine miles in width. The surface is estimated at about 600 square miles, which is equal to that of Hertfordshire. The larger mountain-mass, which occupies the eastern portion of the island, is supposed to rise nearly 10,000 feet above the sea, but it contains only a small portion of low and cultivable land. The smaller mountain-mass or peninsula has a fine tract of level land along the south-western coast. It extends three miles along the beach, and runs three quarters of a mile inland. At the back of it there are well-wooded slopes, with broad valleys, which terminate, towards the summit of the mountains, in deep ravines. The mountains, which rise to about 5000 feet, are also well wooded. The harbour of Laheina, nearly in the centre of the plain, is formed by two low projecting rocks, two miles distant from each other. Laheina consists of a number of scattered huts, and it contains an establishment for converting the natives to Christianity, and for diffusing useful knowledge among them.

Tahaurawe lies south west of the larger peninsula of Mauï. It is about 11 miles long from east to west, and 8 wide in the broadest part. The surface hardly exceeds 60 square miles. Like the other islands, it is composed of lava, which however rises only to a moderate elevation. The soil is thin, and covered with a species of coarse grass. The population is small. Between this island and Mauï is that of Morokini, which is a small and barren rock of some elevation; it is only occasionally visited by fishermen.

Ranaï, which lies west of the smaller peninsula of Mauï, is separated from that island by a strait nine or ten miles wide. It is 17 miles long and about nine miles wide, and may cover a surface of somewhat more than 100 square miles, or about half the area of the Isle of Wight or the county of Rutland. It is likewise a mass of volcanic rocks, but it does not rise to a great elevation, nor is the surface so broken and irregular as that of the other islands. A great part of it is barren, and the remainder is only of moderate fertility, the soil being shallow, so that trees grow only in the ravines and glens. The population is estimated to amount to 2000.

Morokaï, or *Morotoi*, lies north-west of Maui and north of Ranaï; it extends 40 miles from east to west, and seven from south to north. The area may be 200 square miles, which is equal to that of the Isle of Wight. It consists of one mass of rocks, the most elevated portion of which rises about 5000 feet above the sea, and the sides are furrowed by deep ravines full of trees. Level tracts of small extent occur along the shores, and many of them are fertile. The number of inhabitants is said not to exceed 3000.

Oahu, or *Woahoo*, lies north-west [illegible] tends 46 miles in length from south-east to north-west, [illegible] is 23 miles across in the widest part. The surface prob[illegible] occupies 700 square miles, and is equal to that of the [illegible] of Skye. It is at present the most important island [illegible] whole group, being the seat of government and the [illegible] which the foreign commerce is concentrated. It [illegible] also a larger proportion of cultivated land than t[illegible] islands.

A mountain-range traverses the island: it begins at the north-eastern point, called Mocapu, and runs first southward and afterwards inclines to the south west, terminating, at Diamond Point, the south-western cape of the island, in a hill about 400 feet high. This ra[illegible] than 3000 feet above the sea-level, and, with [illegible] by which it is intersected, covers about half the surface [illegible] the island. Another mountain-mass occupies the north-western part, but it is not connected with the chain, being separated from it by a plain extending from the mouth [illegible] Pearl River to Waiarua on the northern coast, a distance of nearly 20 miles. It is called the Plain of Eva, and [illegible] fertile and well wooded, but not much cultivated. The soil consists of a deep mould resting on lava. T[illegible] country along the southern shores, from the mouth [illegible] River to the vicinity of Honoruru, has a very [illegible] hilly surface, and varies greatly in fertility, [illegible] pressions having a rich soil, whilst most of the higher [illegible] are nearly destitute of vegetation. But the plain of Honoruru, which follows, and extends about ten miles along the shore, with a width varying from two to three miles, has a very rich alluvial soil, and is carefully cultivated. Several wide valleys, which extend northward into the mountain-range, open into this plain, and are also cultivated to the distance of six or seven miles from the shore, where they begin to be narrow, and to be enclosed by steep mountains on each side. South-east of the Plain of Honoruru, up to Diamond Point, the country is more uneven and less fertile. The country which lies between the mountains and the north-eastern shore is very hilly, and much less fertile and less populous than that along the southern coast. The [illegible] of the range towards this level plain is exceedingly [illegible] and there is only a path through the fertile valley of A[illegible]anu, which constitutes the communication between the opposite sides of the island. The population of Oahu is stated not to exceed 20,000, which however seems to be a low estimate.

Honoruru, the capital of the Sandwich Islands, and the residence of the king, contains about 8000 inhabitants. It consists of about a dozen stone houses built by foreign merchants, and a number of huts of the natives not arranged in regular streets. The residence of the king resembles a Dutch barn. The harbour is small, being not more than half a mile long and a quarter broad; but it is tolerably deep, and perfectly safe. It is formed by a coral reef, which extends along the shores at the distance of some hundred yards, and against which the swell of the sea breaks. These reefs have a considerable width, and are dry at low-water. A narrow opening in them opposite to Honoruru forms the entrance to the port, which however is not deep enough for large vessels, and they remain in the roadstead, which is capacious, but has a rocky and uneven bottom.

Tauai, or *Atooï*, west-north-west of Oahu, is about forty miles long, and more than twenty-four miles broad in the widest place. The surface is between 600 and 7[illegible] square miles. It is a mountain mass sloping on all sides towards the sea, where it terminates with a rather high coast. Wide valleys run from the shores towards the centre of the island, and they are well cultivated and fertile, though less so than the most fertile districts in Oahu or Mauï. On the southern coast, at Waimea, there is a roadstead, but there is no other anchorage round the island. The number of inhabitants is stated to be 10,000.

Nihau, or *Onechow*, the most western of these islands, is about 20 miles long from north to south, and seven ac[illegible] where widest. The surface may cover about 100 square miles. The most southern point rises abruptly to a considerable height; but about five miles north, the rocky mass sinks down to a moderate elevation, and afterwards rises again, but not so high as before. It is said that the population is small, but this is opposed by the fact that t[illegible] a great number of painted and variegated mats, [illegible] extensively used in all the other islands, and that t[illegible] produces abundance of yams, which also go to the [illegible] islands. On the western side of the island there is a very good harbour.

Climate.—The climate is principally regulated by the trade-winds, which during the summer, or from March to October, are strong and regular, but in winter light, and frequently interrupted by calms and south-westerly winds. The rainy season occurs in winter. In summer the atmosphere is usually clear and bright, and in many places on the western or leeward side of the islands not a drop of rain falls. On the eastern or windward parts however, even in this season, seldom a day or night passes without a smart shower, and occasionally heavy rains fall. There seems to be some irregularity in this respect, as it is stated that the north-eastern districts of Oahu have much less rain than the south-western, and that this is the cause of their being less productive. From September to April the atmosphere is more or less hazy, obscure, and cloudy, with frequent light rains in some places, and in other parts heavy rains of two or three days' continuance. The small islands of Ranaï and Tahaurawe, which are rather low, and protected against the trade-winds by the high lands of Mauï, frequently suffer from long droughts.

The heat all the year round is considerable in the lower tracts, but perhaps less than might be supposed from the latitude. This is partly owing to the vast expanse of water by which the islands are surrounded, but principally to the prevalence of the north-east trade-wind, which during the greater part of the year sweeps over and about the islands with great velocity, and having passed a great expanse of sea, is far from being hot. In the eastern districts the thermometer in summer seldom rises higher than 80° or 82°, and during the winter not higher than 72° or 74°. But the lower tracts on the western side of the mountains are exposed to greater heat, and in those parts the thermometer frequently rises to 88° or 90°. According to observations made at Honoruru, the mean annual temperature of that place does not exceed 75°. In general the thermometer ranges between 70° and 83°. The greatest heat experienced was 88°, and the least 61°. The elevated table-land in the interior of Hawaiï is of course much colder, and snow frequently fall there. In 1834 the higher part of the Mouna Roa was covered with snow for 2000 feet from its summit in winter.

In the lower districts on the western side of the islands the sea and land breezes are generally regular, especially during the summer. The sea-breeze sets in at ten o'clock in the morning, and continues till sunset, when it is immediately followed by the land-breeze, which lasts till sunrise. From sunrise till ten o'clock a calm prevails.

Productions.—The quadrupeds found on these islands at the time of their discovery were the hog, dog, and rat, to which have been added the cow, horse, sheep, goat, and mouse, all of which thrive very well except the sheep. Fowls were found at the discovery; but turkeys, geese, ducks, and pigeons were introduced afterwards. Only a limited number of species of birds and other animals is met with even in the thick forests which surround the base of the mountains and ascend their sides to a considerable height. Fish abound; but there is no great variety. The most common are sharks, bonetos, flying-fishes, and red and white mullets. Many families live on the produce of the fishery. Pearls are found in Pearl River; they are small, but fine.

It does not appear that the European grains are cultivated to any great extent, with the exception of maize. The principal objects of cultivation are roots, especially the tarro-root (Arum macrorhizon). Potatoes, and camotes, or sweet potatoes, are also generally grown. The fruit-trees which were cultivated before the arrival of Europeans, were the cocoa-nut, the bread-fruit-tree (*Artocarpus incisa*), the ohia (*Eugenia malaccensis*) or jumbo-tree of the East Indies, and the kou (*Cordia orientalis*); several kinds of bananas were also grown, and among them one kind the fruit of which is dried by the natives. Strawberries and raspberries are also indigenous. The Europeans have introduced oranges, lemons, citrons, grapes, pine-apples, papaw-apples, pomegranates, and figs, all of which come to perfection, except pine-apples. The sugar-cane is indigenous and much cultivated, but only for eating. Melons and water-melons are excellent. The most cultivated vegetables are cucumbers, pumpkins, French beans, onions, and red pepper. The wauti, or paper-mulberry-tree (*Broussonetia papyrifera*), is grown for its interior bark, which is used here, as in China, for making cloth. But the finest tapas or wrappers are made from the *Böhmeria albida* (Hook), which grows wild in the forests, and is also cultivated.

The forests do not contain many trees fit for ship-building. In several parts the mountains were formerly covered with sandal-wood; but as the exportation of this wood to China has been very great, it begins to be rare, except in some places, as south of Byron's Bay in Hawaii and on the most western mountains of Oahu. The forests contain several plants the roots or fruits of which are used as food by the natives and for other domestic purposes.

Salt is the only mineral which is obtained in abundance. A large quantity is got from a salt-lake in the island of Oahu, west of Honoruru, which is between two and three miles in circumference, but has only a few feet of water in the deepest parts. The bottom and shores are incrusted with salt, the water being strongly impregnated, and the crystallization very rapid. This salt is exported to Kamtchatka. Large quantities of salt are also obtained from sea-water by evaporation, for which purpose there is along the shore a succession of artificial vats of clay, into which the salt water is let at high tide.

Inhabitants.—The population consists of natives, with the exception of a small number of whites, Englishmen and Americans, who have settled among them as merchants or as missionaries. The population was estimated, fifteen years ago, at 139,000 individuals, but it was probably underrated. The natives, who call themselves Kanaka, belong to the family of Malay nations. Their colour is neither yellow, as in the Malays, nor red, like that of the Americans, but something between both, a kind of olive, and sometimes reddish brown. They are of middle stature, and well formed, with muscular limbs, and open countenances. The roots of their language have a great affinity to those of the other Malay nations who inhabit the islands of the Pacific. When these islands were discovered by Cook, it was observed that the natives of this group had made further progress in civilization than those of the other islands and groups. This was evident from the care with which the tarro-fields were cultivated, but still more from their manufacturing cloth from the bark of the paper-mulberry and other trees, their beautiful mats, and the art with which they united, and as it were wove together, many beautiful feathers, so as to be used as articles of dress. They also made several utensils of stone, wood, and shells, without the use of iron tools. At that time they wore only a wrapper (called tapa) about their loins, but many of them now dress in the European fashion. They have also improved in other respects, especially in ship-building and navigation. Vessels built at Honoruru, and manned by natives, traverse the Pacific to Canton. Several of the chiefs have begun to build houses in the European style.

Commerce.—What is properly called trade is not important, as the natives have only two articles of exportation, salt and sandal-wood. Agriculture has not yet supplied an article for exportation, but by selling their produce to the vessels which visit the islands, the natives procure all the foreign articles that they are in want of. In 1832 the harbour of Honoruru alone was visited by 159 vessels, mostly American and English. Many of these vessels are whalers, and others go to several parts of the western coast of North America to get furs for the Chinese market. Several of them however are bound to China and the East Indies, and have passed round Cape Horn or through the Strait of Magalhaens. As the trade-winds in the centre of the southern half of the Pacific are very irregular, the most expeditious route to the East Indies is to sail at a considerable distance from the shores of South America to the Gallapagos, and thence to the Sandwich Islands, whence a regular and strong east trade-wind carries them to the coast of China. All these vessels get fresh provisions at the Sandwich Islands, and the demand is still greater than the supply, which is shown by the very high price which all provisions fetch. The number of these vessels is annually increasing.

History and Government.—These islands were discovered by Captain James Cook in 1778, and again visited by him on his return from Behring's Strait, when he was killed by the natives. Within the first twenty years after their discovery they were only visited by Portlock and Dixon, La Perouse and Vancouver. But towards the end of the last century whaling-ships from America began to visit these seas, and they were soon followed by fur-traders; all these vessels put into some of the ports for provisions. At that time each island had its sovereign and several other chiefs. One of the latter, Tamehameha, began to plan the conquest of the islands, and he succeeded in subduing all of them, except Tauaï and Nihau, whose sovereign, after the death of Tamehameha acknowledged the successor of that prince as his king. As Tamehameha had only succeeded in his enterprise by the aid of Europeans, and the assistance which he derived from their visits, he favoured their settlement in the islands, and in 1817 he placed his kingdom under the protection of England. His successor, Rhio-Rhio, came to London, where he died in 1824. Soon after the death of his father he had succeeded in abolishing idolatry and in the conversion of the natives to Christianity (1819). Since that time many English and American missionaries have resorted to these islands, and their labours have been attended with considerable success. At present, perhaps half of the population are Christians. Several books have already been printed in the native language at Honoruru and Laheina, and even a map of the island has been engraved at Laheina.

There are four distinct ranks in society. The first consists of the royal family; the second, of the first class of chiefs, whose dignity is hereditary; the third class is composed of the minor chiefs, who pay a ground-rent for the use of the lands in their districts; the bulk of the people, comprehending the whole productive class, constitutes the lowest section of the nation. The king is considered as the proprietor of the ground, which he has divided among the chiefs, who in return are bound to military service and to pay ground-rents. Every island has a governor, and is divided into several districts, each of which is under a chief. The taxes to the king are paid by the chief or governor of the island, who collects them from the minor chiefs, and these again from the people, with the addition of something for their trouble.

(Cook's *Third Voyage to the Pacific*; Portlock's *Voyage round the World*; Lord Byron's *Voyage of H.M.S. Blonde to the Sandwich Islands*; Ellis, *Tour through Hawaii*; Stewart's *Journal of a Residence in the Sandwich Islands*; Douglas, 'On the Volcanoes of the Island of Hawaii,' in *London Geographical Journal*, vol. iv.; and Bennet's 'Journal of a Voyage round the World,' in *London Geographical Journal*, vol. vii.)

SANDWICH LAND is the name given by Cook to a number of islands in the Southern Atlantic, between 57° 10′ and 59° 40′ S. lat. and between 24° and 27° 42″ W. long. They extend from north to south. The most northern group is called Candlemas Islands, and the most southern is named the Southern Thule. They are all of volcanic origin, and nine burning volcanos were seen on them by Morell. Some of them are very high, and covered with perpetual snow. Others are bare rocky masses, slightly elevated above the sea-level, but all of them are without any trace of vegetation. The surrounding sea contains sea-elephants and cetaceous animals.

(Cook's *Second Voyage round the World*; Morell's *Narrative of Four Voyages to the South Sea, &c.*)

SANDYHOOK. [NEW YORK.]

SANDYS, GEORGE, an English poet, was born in 1577, at the palace of Bishopsthorpe, his father, Dr. Edwin Sandys, being then Archbishop of York. In 1589, the year after his father's death, he was sent to Oxford, and became a member, first of St. Mary Hall, and afterwards, as Wood thinks, of Corpus Christi College. (*Athen. Oxon.*) We have no account how he passed his time between this period and the year 1610, when he commenced his travels in the East, returning, as Wood supposes, 'in 1612, or after, much improved in several respects, being master of several languages, of a fluent and ready discourse, and of excellent comportment; having naturally a poetical fancy, and a zealous inclination to all human learning, which made his company desired and most acceptable to most virtuous men and scholars of his time.' His account of his travels was published in 1615, being dedicated to Charles, then Prince of Wales, and entitled 'A Relation of a Journey begun in 1610, in Four Books, containing a Description of the Turkish Empire, of Egypt, of the Holy Land, and of the remote parts of Italy and islands adjoining.'

After this Sandys went to America, and appears to have succeeded his brother as treasurer for the English colony of Virginia. During his residence he completed his translation of the 'Metamorphosis' of Ov
some time engaged. On his return
pointed one of the gentlemen of the privy
In 1636 he published a 'Paraphrase
two years afterwards 'Paraphrases
clesiastes, the Lamentations of
lected out of the Old and New Te
lation of 'Christ's Passion,' a
last work was the poetical version
in 1642. He died at Bexley Abbey. in

The writings of Sandys are
his travels are learned without
without being tedious; and are valuable
give of the East in his time,
poetical writings contributed,
rick, to the formation of a well
sification, the natural accomp
thought and expression for
His merits in this respect have
Waller, Dryden, and Warton. Sp
beautiful compositions, both in poetry
in the Memoir of his Life, by the H. J.
to 'Selections from Sandys's Met]
London, 1839, from which biography

SANGALLO, or SAN GALLO,
guished Italian artists and architects,
was Giamberti.

1, GIULIANO GIAMBERTI, born in 1443, was the son of Francisco Giamberti, who was himself an architect of some repute in the service of Cosmo de' Medici. At first both he and his brother Antonio chiefly practised carving in wood, in which they acquired some celebrity. Giuliano was next employed in the capacity of military engineer by Lorenzo de' Medici, who rated his services very highly. So patronised, Giuliano determined on pursuing architecture as his profession; and he had soon an opportunity of displaying his talent in the fore-court or cloister of the church of Santa Maddalena de' Pazzi at Florence, wherein he introduced an Ionic order, whose capitals are remarkable for having an ornamental necking, at that time an innovation, and said to have been imitated from an antique fragment found at Fiesole. He was afterwards commissioned by Lorenzo himself to erect a large convent (destroyed during the siege in 1530) near the gate of San Gallo; whence he obtained the name of *da San Gallo*, at first jestingly bestowed on him by his patron, and afterwards adopted by himself and the rest of the family. In 1490 he commenced the Palazzo Gondi for a wealthy merchant of that name, but, owing to the death of the latter, the building was not completed; nevertheless, what was executed is a fine specimen of the Florentine style, though the irregularity both of the courses and lengths of the rustics [RUSTICATION] is rather a defect. Among his numerous other works was a palace erected by him at Savona, for his patron the Cardinal della Rovere (now converted into the convent of Santa Chiara): besides other buildings for the same prelate. When Rovere was elevated to the pontificate by the title of Julius II. Sangallo expected to be employed as architect of the new St. Peter's church; but being supplanted by Bramante, he retired in disgust to Florence. On the election of Leo X. he returned to Rome, and on the death of Bramante was offered the appointment of architect of St. Peter's, but he declined it on account of his age and infirmities, and returning to Florence, died there two years afterwards (1517), at the age of 74.

Giuliano had a son named Francesco, who is spoken of by Vasari as a skilful sculptor then living, and who executed the mausoleum erected at Monte Cassino by Clement VII. in honour of Piero de' Medici.

2, ANTONIO SANGALLO, br of
induced by him to quit the pro
of architect, and was left
he had begun at Savona.
where he ingratiated himself with
he proposed to convert Hadrian'
and he altered that build
which time it has been
This work gave so much
to his son the Duke Vale
him to erect the fortress Civ
wards that of Montefiascone. He
churches, among which that of
ciano is esteemed his best produc

time before his death, in 1534, he gave up both architecture and sculpture, and amused himself with agricultural pursuits.

3. Antonio Sangallo, the most noted of the family, was nephew to the two preceding on the mother's side, from whom he received their surname, that of his father, who was a cooper at Mugello, being Bartolomeo Picconi. He was at first put to the business of a common carpenter, but the fame of his uncles determined him to set out for Rome and become their pupil; and when they quitted that city, he found another instructor and protector in Bramante, to whom, then advanced in years, he soon rendered himself a most useful assistant. Nor was it long before his talents obtained for him the notice of persons of rank, among the rest of Cardinal Alexander Farnese (afterwards Paul III.), who employed him to rebuild his mansion in the Campo de' Fiori, the first beginning of that splendid pile, which would of itself alone have es- li ed the reputation of Sangallo. One of his earliest was the church of la Madonna di Loretto, near an's pillar; but as that edifice was begun in 1507, it is tful whether he did more than afterwards complete it. other works of the same period were several private or palazzi, especially one for Marchionne Baldas- as neither the buildings themselves are described their sites distinctly indicated by Vasari and his other hers, and as many of them have repeatedly changed s, it is now difficult to specify or ascertain them. equ ult to determine their respective dates; we may t re break through chronological order, and ution the house that he afterwards built for himself e Giulia, now known as the Palazzo Sacchetti. g by the various works on military architecture, which he was employed at different times at Cività ia, Parma, Piacenza, Ancona, and other places, we proceed to consider Sangallo's project for completing Peter's. After the works had been nearly suspended for several years, Paul III. determined that they uld be resumed vigorously, and on the death of Peruzzi, 1536, Sangallo became the sole architect. With the view of preventing those changes which had been made by all the preceding architects, the pope ordered him to prepare a model, upon such a scale and in such an expensive nner, that there should be no danger of its being either or destroyed. This model, which is said to have several years to execute, and to have cost upwards of crowns, is still preserved in one of the rooms of the Vatican. It is formed of wood, and is in length 35 Roman palms, or nearly 20 English feet. Little more however was done to the fabric by Sangallo than to strengthen the parts dy erected; and after his death his design was abandoned her, not a trace of it being visible in the present struc- elevation of Sangallo's model is given in the first vo- of ood's 'Letters of an Architect,' from which it may hat if it had been followed, the building would have ally different from what it now is. The cupola would had two orders, one around the tambour, another carup above the spring of the dome, which would also have of ch lower proportions than the present one, while conspicuous features would have been two exceed- and tapering campanili, contrasting and at the ti harmonising with the cupola itself. It is true the roken into a multiplicity of parts, yet they are both proportioned to each other, and picturesquely ed; and the whole is consistent in character, which re than can be affirmed of Maderno's façade, where is a want of agreement between the order itself and he other parts, and also a deficiency in variety of outline.

The Palazzo Farnese, begun by him for his patron Paul II. when cardinal, and afterwards greatly extended, is the st celebrated of Sangallo's works. He must however the repute of it with Michael Angelo, who, if he did, as some have supposed, add the third tier of windows, ed the magnificent and majestic cornicione, which distinguishes this edifice from every other of the in Rome, and, aided by the loftiness and extent of edifice itself, gives it a colossal air. This noble structure deserves notice, if only because it has been said that Reform Club-House, Pall-Mall, is an imitation of it, ch is true only as regards style and manner; for in d to design there are quite as many points of disarity as of resemblance between them, and many of are to the advantage of Mr. Barry's building. In both indows of the principal floor are *à la tabernacle,* that is, have small columns and pediments; but in Sangallo's edifice the centre window is different from the others, and having no pediment, like them, produces a disagreeable effect. Sangallo begun the Porta S. Spirito at Rome, but left it unfinished, in which state it has ever since remained. He died at Terni, in October, 1546, advanced in years, but at what precise age is not known. His body was brought to Rome and buried with great pomp.

SANGUINOLA'RIA. [Pyloridians, vol. xix., p. 145.]

SANGUISORBA, the name of a genus of plants, the type of the suborder Sanguisorbeæ, in the natural order Rosaceæ. Of this genus (called Burnet) there are nine known species. Most of them possess astringent properties. The common Burnet (*S. officinalis*) is a native of Britain, and was at one time cultivated in chalky districts to a very considerable extent, but it has lately been superseded by sainfoin [Sainfoin] and other artificial grasses.

SANGUI'SUGA. [Leeches.]

SANHEDRIM, or SANHEDRIN (סַנְהֶדְרִין), the great council of the Jews, which consisted of seventy-one or seventy-two members, and decided the most important causes, both ecclesiastical and civil. The name is a corruption by the Talmudists of the Greek *συνέδριον* (*a council*). The Rabbis attempt to find the origin of the Sanhedrim in the seventy elders who were appointed by Moses to assist him in his judicial duties (*Numb.*, xi. 16); but this council was evidently temporary, and we hear nothing of it in the subsequent history of the Jews. (Moses, p. 441; Michaelis *On the Laws of Moses*, art 50.) The exact time of the institution of the Sanhedrim is unknown, but there is no reason to suppose that it was earlier than the time of the Maccabees. There can however be little doubt that the Sanhedrim was an *imitation* of the seventy elders of Moses. The first mention of the Sanhedrim is in the time of Hyrcanus II., when Herod was tried before it. (Joseph., *Antiq.*, xiv. 9, s. 3, 4.)

The Sanhedrim had a president (רֹאשׁ or נָשִׂיא), who was generally the high-priest, a vice-president (אַבִי בֵית דִין), who sat on the right of the president, and, according to some, a second vice-president (חָכָם), who sat on his left. The other members were:—1, *Chief Priests*, who are often mentioned in the New Testament and in Josephus, and who were partly ex-high-priests and partly the heads of the twenty-four classes of priests. 2, *Elders*, that is, the princes of tribes and heads of families. 3, *Scribes*, or men of learning. All chief-priests were members of the Sanhedrim, but of elders and scribes only so many were admitted into it as were required to fill up vacancies. (*Matt.*, xxvi. 57, 59; xxvii. 3, 12, 20, 41; *Mark*, viii. 31; xi. 27; xiv. 43, 53; xv. 1; *Acts*, iv. 5; v. 21, 27.) The Talmudists say that the tribunal had its secretaries and apparitors. Both Pharisees and Sadducees were found in it. (*Acts*, v. 17, 21, 34; xxiii. 6.)

The Sanhedrim met at Jerusalem, and, according to the Talmudists, in a chamber within the precincts of the Temple, called *Gazith*, in which also their archives were kept; but, according to Josephus (*Bell. Jud.*, v. 4, 2; vi. 6, 3), in a room on the east side of Mount Zion, not far from the Temple. In cases of emergency, as in the trial of Christ, they met in the high-priest's house. They sat in the form of a semicircle.

The causes brought before this tribunal were either appeals from the inferior courts, or matters which were thought of sufficient importance to come before them in the first instance; for example, the question whether a person was a false prophet (*Luke*, xiii. 33), and matters which affected the whole state, a whole tribe, or the high-priest. The accused was brought before the tribunal, and witnesses were required to appear to support the charge. Either capital or minor punishments might be inflicted by the Sanhedrim; but under the Roman government its power was so far restricted that a capital sentence required the confirmation of the Roman governor, who was also charged with its execution. The stoning of Stephen was not done in accordance with the sentence of the Sanhedrim, but in a riot; and the execution of James and others by the high-priest Ananus (A.D. 64) took place in the absence of the Roman procurator, and is admitted by the Jews themselves to have been an illegal act.

Besides the Sanhedrim at Jerusalem, there were inferior courts in each town of Judaea, consisting of twenty-three members, to which the same name is sometimes applied. From these courts an appeal could be made to the Sanhedrim.

(Jahn, *Archäol. Bibl.*, th. ii., b. ii., § 186; Calmet's *Dictionary;* Lightfoot's *Works;* Winer's *Bibl. Realwörterbuch*, 'Synedrium.')

SANJAK, a word primarily signifying a standard, is also applied to a military division such as those into which the whole Turkish empire is divided: in this sense, it signifies, as much as is congregated under one standard. The commander of such a division is styled Sanjak, Sanjak Bey, or simply Bey, and the supreme general of all the Sanjaks of a province is styled the Beglerbey (commander of commanders). The word is found under the forms Sangiak and Sandshak, the French and German modes of rendering the Turkish word.

SANKHYA. [SANSCRIT LANGUAGE AND LITERATURE.]

SANMICHE'LI, MICHE'LE, a master equally celebrated for his works in civil and military architecture, was born in 1484, at Verona, where both his father Giovanni and his uncle Bartolomeo pursued the same profession. By them he was instructed in the elements of the art, but he caught its spirit from studying the amphitheatre and other remains of antiquity in his native city; and their influence, especially that of the former, is visible in many of his designs, wherein he greatly affected massive rusticated work. About the year 1500 he set out for Rome, and remained either there or in other parts of the ecclesiastical states till the time of Clement VII., and was intimate with all the more celebrated artists of the time—Bramante, Michael Angelo, the Sangalli, Sansovino, and others. While he was in that part of Italy, he erected the cathedral of Montefiascone (the cupola of which was destroyed by fire at the beginning of the seventeenth century, and has since been rebuilt in a tasteless manner), and the church of San Domenico at Orvieto. Returning to the Venetian territory, he was employed by the republic (1525) to construct the new fortifications of Verona, when he first introduced the use of triangular and pentangular bastions, and thereby entirely changed the system of military architecture, that method being thenceforth adopted by other engineers. Here it will be sufficient merely to allude to his works of that class, as they belong to construction rather than design, though some of them are remarkable even in the latter respect; for instance, the stately rusticated façade of the fortress or Castello di S. Andrea on the Lido at Venice, and the three fortified gates at Verona, Porta Nuova, Porta del Palio, and Porta Zenone.

He was next employed by the republic in fortifying many places in Istria and Dalmatia, Cyprus and Candia, some of which works he confided to the execution of his nephew Gian-Girolamo. In consequence of their reputation, both uncle and nephew were invited by Francis I. and the emperor Charles V. to enter their service, which flattering offers they nevertheless rejected. Whether these numerous engagements and his divided application to two such very opposite studies did not prevent Sanmicheli from attaining to that excellence in the latter which he might else have reached, may fairly be questioned; for with many merits, his designs often exhibit glaring faults, which, if he had confined himself entirely to the study and practice of civil architecture, he would perhaps not have fallen into. In fact, the best of his palazzi and other works of that class are far from being models, except as to their façades and exteriors, being most inconvenient in their plans, besides abounding with monstrous deformities, such as rooms quite out of square, and sometimes with no two sides parallel; and in one instance (Palazzo Bevilacqua) he has placed the principal staircase in an open court, without any protection whatever from the weather. His exterior architecture exhibits less of mannerism, and more both of invention and nobleness of taste than that of Palladio, but also not a little that is decidedly faulty and offensive. Almost all his buildings are marked by a disagreeable inequality of design, there being a singular mixture of parts highly enriched and others nakedly plain in the same composition. His balustrades to windows and pedestals to columns are too high, and in more than one instance he has raised his columns on a second pedestal over the first one. His style shows itself to most advantage in his lofty rusticated basements, which generally possess an air of dignity. Among the palazzi erected by him are the P. Grimani and the P. Cornaro à S. Paolo at Venice, and the P. Canossa, Bevilacqua, Verza, Pelligrini, and Pompei at Verona. In Verona he also built the church of the Madonna di Campagna, and the much admired Cappella Pellegrini, for both which we refer to the table accompanying ROTUNDA. While Sanmicheli was enjoying a tranquil and honourable old age, esteemed by all no less for his personal qualities than for his talents, he received the intelligence of the death of his nephew and pupil Gian-Girolamo, who died in the island of Cyprus at the age of forty-four; and it had such an effect upon him, that he survived the fatal news only a few days, dying in 1559, in his seventy-fifth year.

SANNAZA'RO, JA'COPO, born at Naples, in 1458, of a noble family originally from Spain, studied at Naples, and afterwards, being disappointed in love, left his country and travelled to France, where he began writing his 'Arcadia,' a pastoral fable in Italian, in which he describes in poetical colours the scenes and occupations of pastoral life. It is a mixed composition of prose and verse, and has been much admired for the elegance of the style and the purity of the language. Indeed Sannazaro is considered as one of the best Italian classics. The 'Arcadia' has gone through numerous editions. Sannazaro also wrote a Latin poem, 'De Partu Virginis,' which was highly applauded, and which obtained for the author the sanction of two popes, Leo X. and Clement VII., expressed in two briefs. He also wrote Piscatory Eclogues in Latin verse. On his return to Naples, where he was highly esteemed by King Ferdinand I. and his sons Alfonso and Frederic, he fixed his residence on the delightful shore of Mergellina, at the foot of Mount Posilipo, where Frederic, the last king of Naples of the Aragonese dynasty, had given him a country-house, and where he saw before him the daily occupations of the fishermen under a sky and in a climate which render their labours less irksome, and impart to them a sort of poetical appearance. When the Aragonese dynasty was driven away from Naples by the treachery of their relative Ferdinand the Catholic of Spain, Sannazaro accompanied his patron King Frederic in his exile, and remained with him in France till Frederic's death, after which he returned to Naples, where he died in 1530. He was buried in a church on the slope of Posilipo, which he had built and dedicated to the Virgin, and where his monument is still seen.

SA'NNIO, a province of the kingdom of Naples, formerly called Contado di Molise, lies chiefly on the east side of the central ridge of the Apennines, and extends as far as the Adriatic coast. The district of Isernia however, which belongs to the administrative province of Sannio, lies on the west slope of the Apennines, and belongs to the basin of the Volturno. Sannio is bounded on the north-west by the province of Abruzzo Citra; north and north-east by the Adriatic; south-east by Capitanata; south by Principato Ultra, or the province of Avellino; and south-west by Terra di Lavoro. The province is crossed in its length by the river Biferno, the antient Tifernus, which rises from two sources in the high Apennines near Bojano, and flowing north-east enters the Adriatic near the town of Termoli, after a tortuous course of about 60 miles. The other principal river of the province is the Trigno, which flows nearly parallel to, but to the north of the Biferno.

In the lower part of its course the Trigno marks the boundary between Sannio and the province of Abruzzo Citra. South of the Biferno, the Tortore constitutes, during part of its course, the boundary between Sannio and Capitanata. The geographical character of the province of Sannio resembles that of the neighbouring provinces of Abruzzo. The central ridge of the Apennines, which runs in a general direction from north-west to south-east, sends out several offsets, which run in a north-east direction to the Adriatic coast. Between these offsets there are va[illegible]s through which the rivers flow with a rapid course. [illegible] two pr[illegible]cipal valleys are those of the Trigno and the [illegible] valleys and the lower hills are very fertile, and pr[illegible] Indian corn, pulse, oil, wine, and fruits. A[illegible] however in a very low condition. The highlar[illegible] used for summer pasture. The forests wit[illegible] higher Apennines were once covered, have [illegible] destroyed, and the mountains are now nearly [illegible] of the province of Sannio is reckoned at abo[illegible] miles, and the population, by the census of 183[illegible] to 342,778. Of the male part of this population [illegible] proprietors of land or houses, 139,000 agri[illegible]tural [illegible]ers, 6000 shepherds or herdsmen, 17[illegible]

1100 are keepers of wine-shops, 323 sailors or fishermen, and the rest are employed in various trades. There are about 1100 priests, 327 monks, and about 80 nuns. (Serristori.) The chief manufacturing industry in the province is that of cutlery and fire-arms, which is established at Campobasso, Frossolone, and Agnone, and gives employment to about 400 men. There are about 120 fishing-boats and small craft belonging to the province; but there is no harbour on the coast. In 1824 there were only three printers in the whole province, and not a single bookseller. (Petroni, *Censimento de' Reali Dominj.*)

The province is divided into three districts:—Campobasso, which is the largest, and embraces the central part of the province; Larino, which extends near the sea-coast; and Isernia, which lies west of the Apennines. The whole province contains 135 communes; it has a civil and criminal court at Campobasso, from which there is an appeal to the Gran Corte, or supreme tribunal of Naples. The ecclesiastical administration is under the five bishops of Larino, Termoli, Isernia, Bojano, and Trivento; and there are 164 parish incumbents. There are 252 churches, 398 hospitals and other charitable institutions, a royal college, and an institution for female boarders at Campobasso, and three 'scuole secondarie,' a kind of grammar-schools, at Cascalenda, Montenero di Bisaccia, and Morcone. There are elementary schools in many communes, but the system of elementary instruction in the whole kingdom of Naples is neither uniform nor well arranged.

The following are the principal towns of the province of Sannio:—1. Campobasso, a town indifferently built, but pleasantly situated on the slope of a hill above the valley of the Biferno, has manufactories of cutlery, which supply the whole kingdom, and 8000 inhabitants. 2. Trivento, in the valley of the Trigno, is a bishop's see, with 3000 inhabitants: it contains some antient remains. 3. Sepino, the antient Sepinum, formerly a town of the Samnites, is situated in the Apennines, which here divide the valley of the Tiferno from that of the Tamaro, an affluent of the Volturno: it has several churches and convents, a classical seminary, a paper manufactory, and 4000 inhabitants. 4. Termoli, the antient Interamna, a small town on the sea-coast, between the mouth of the Trigno and that of the Biferno, has a castle on a promontory. 5. Larino is a small town, in the valley of the Biferno, not far from the sea, and the head of a district. Near Larino is the Albanian or Epirote colony of Ururi. 6. Agnone is a thriving modern town, with iron and copper works, and about 7000 inhabitants. 7. Bojano is an old decayed town in the Apennines, near the sources of the Biferno. 8. Isernia, an old-looking town, situated in a valley on the west side of the Apennines, near the Volturno, and on the high road from Naples to Abruzzo, contains several remains of antiquity, and has some manufactories of coarse woollens, with about 5000 inhabitants. From Isernia a carriage road branches off to the eastward, crosses the central ridge to Bojano, and leads to Campobasso and Larino. The province of Sannio comprises only a part of the antient Samnium, which also included the whole of the Principato Ultra and part of Terra di Lavoro. [SAMNITES.]

SANOK, one of the nineteen circles of Austrian Galicia, is bounded on the north by Rzeszow and Przemysl, on the east by Sambor, on the west by Yaslo, and on the south by Hungary. Its area is about 2130 square miles, with 250,000 inhabitants. The Carpathians rise in the south, and send their offsets through the whole circle; there are many and extensive forests; the soil is partly sandy, and poor, with some intervening parts that are more productive. The river San flows in a large curve through the country, and is joined by most of the smaller streams. The Wisloka rises in this circle, and passes, on the western frontier, o that of Yaslo. Agriculture, the breeding of cattle, and cultivation of the forests are the chief occupations of the abitants. Salt and petroleum are sources of considerable profit, and the manufacture of yarn and linen is not unimportant.

SANOK, the chief town, is situated on a mountain on he l bank of the San. It is an ill-built open market; the houses are mostly of wood, and there are cely 2000 inhabitants. There are one Roman Catholic one Greek church, a Minorite convent, a high school, the court of justice of the circle. Opposite the town, right bank of the San, is the imperial stud of ce, where there are stables for nearly 200 stallions, which is spoken of as well worthy the attention of travellers.

SANQUHAR. [DUMFRIESSHIRE.]

SANS SOUCI. [POTSDAM.]

SANSANDING, a town in Africa, in the kingdom of Bambarra, on the banks of the river Joliba, or Quorra, near 13° N. lat. and 5° W. long. It is a place of considerable extent, containing a population of between 8000 and 10,000. It appears to be a town of great commercial importance in the interior of Africa, perhaps not less so than Timbuctoo, with which it carries on an active trade by means of the river, which is navigable for large river boats all the way between the two towns. All the salt which is consumed in the western countries of Sudan is brought from the Sahara, and passes through this town. The merchants of Walet in Beroo bring to it the rock-salt of the mines of Shingarin, and caffilas from El Arovan bring the produce of the mines of Toudeni. By the latter it receives also coral and beads from the Mediterranean. These articles are sent to the countries south and west of Sansanding, and exchanged for gold, ivory, slaves, wax, honey, and cloth of Soodan, which are afterwards sent to Walet and El Arovan. Rice and cured provisions also go to the last-mentioned place, which is surrounded by an extremely sterile country. The trade of this place is in the hands of the Moors.

(Mungo Park's *Travels in the Interior Districts of Africa;* Caillié's *Travels through Central Africa to Timbuctoo, &c.*)

SANSCRIT LANGUAGE AND LITERATURE.—*Language.*—The Sanscrit is a branch of the Indo-Germanic family of languages. Of all those languages it is that which approaches nearest to the primitive type; and by the originality, purity, and abundance of its forms, is peculiarly calculated to throw light on the obscure laws of the formation of language. Being also possessed of a rich literature, and the whole of its materials having been fully treated of by native grammarians, it was no sooner introduced to the learned of Europe than it gave rise to a new philological science, that of comparative grammar, and led to the conclusion that the antient Persian, the Armenian, the Greek, and the Latin, formed but one language with the German, the Lettic, the Slavonian, and even the Celtic, each of these languages affording the most extraordinary illustrations of the others.

The Sanscrit was introduced into India when the Brahminical race obtained possession of the country (A. W. von Schlegel, 'De l'Origine des Hindous,' in the 'Trans. Roy. Soc. Literature,' ii., 2, 405, &c.); and having driven out the languages of the aborigines of India, which are now only spoken in the Southern Deccan, as the Telinga, Tamul, and others, has spread over the extensive tract of country between the Himalayas, the Indus, and the Kistna. Within these limits it has had a history of its own, and has passed through various changes. It appears in its most antient form in the Vedas, in the 13th century before Christ, and in that state is very nearly related to the Zend, the antient language of Persia, and contains many forms and words which have become obsolete. The classical Sanscrit, on the contrary, having once become fixed, has, for about 3000 years, partly as a living language and partly as a learned one, retained the same structure, with the mere exception of difference in style, and a few archaisms, which only occur in the most antient works.

Pracrit Dialects.—Out of the Sanscrit however, even in comparatively early times, dialects arose, which gradually became still farther removed from the original and from each other; and from these dialects the languages now spoken in India are derived. There is a law however which pervades the whole of them; and it is worthy of remark, that this law is precisely the same as that according to which the Romance language, the Italian, the Spanish, and the French, have grown out of the Latin. There is the same softening, the same assimilation, and the same exclusion of the harsher sounds, the same weakening of the forms, the same substitution of particles for cases, and the same periphrastic conjugations. The general name given to these languages by the Indian grammarians is *Prâcrita*, that is, derivative languages; while the term *Sanscrita* is applied to that language which is regularly and grammatically constructed.

The oldest of these dialects, and that which deviates least from the Sanscrit, is the *Pali*, which has become the sacred language of the Buddhists, who, when they abrogated the institution of castes, required a language which, at least for works not strictly scientific, should not be exclusively understood by the privileged classes. Having been carried by the Buddhists from Northern India to Ceylon, the Pali has continued to exist in that island, and possesses a copious literature. (Burnouf and Lassen, 'Essai sur le Pali,' Paris, 1826; Clough, 'Pali Grammar,' Colombo, 1832.) The language which, in a peculiar sense, is called Pracrit, properly *Mâhârâshtrî* (for its local origin is to be sought in the country of the Mahrattas), differs little from the Pali; it is used by the Jains. The *Mâgadhî* and the *Saurasenî*, the former originally spoken in Behar, and the latter on the banks of the Jumna, are only a little farther removed from the Sanscrit. (Lassen, 'Institutiones Linguæ Pracriticæ,' Bonn, 1838.) In addition to these there are numerous more modern dialects, among which we shall only distinguish the Vrajabhâshâ (Brij Bhakha), on account of the excellence of its poetical literature, and as being the parent of the Hindustani.

The formation of the Pracrita languages out of the Sanscrit flowed naturally from the character of the parent tongue, and this tendency is manifested even in the earliest shape of the Sanscrit. This appears, to take a single instance, in the substitution of the *ch* and *j* (the Italian *ci* and *gi*) for the original *k* and *g*, just as the Italian *gielo* is formed from *gelu*). In like manner, it was perfectly consistent with the character of the classical Sanscrit to adopt the verbal forms of the Pracrit, and to retain them together with the legitimate and settled forms, which is a proof that the two languages must have co-existed for a long period.

The Pali appears as a perfectly-formed language in the Buddhist works carried to Ceylon, which we cannot fix at a later date than the fourth century before Christ; and the Mâghadî dialect has been found distinctly recorded, in the middle of the third century B.C., in the inscriptions of King Asoka, which have for the most part been correctly deciphered by Prinsep. ('Jour. Asiat. Soc. Beng.,' 1837, pp. 566, 794, 963.) A Pracrit language likewise appears on the coins of the Greek kings found in Caubul, and near the Indus, most of which have been deciphered by Lassen. Many of the names also which have been transmitted to us by the Greeks are Pracrit; that of the Deccan, for instance, in the Periplus of the Erythræan Sea, Δαχιναβάδης, does not correspond to the Sanscrit *dakshinâpatha*, but strictly to the Pracrit *dakkhinabadha*. Hence it follows, that in the last five centuries B.C. the Pracrit must have become completely the language of the people; and indeed the dramas which were written about this time show the relation of the two languages in the most distinct manner, the men speaking Sanscrit, and the women and inferior characters Pracrit; which is likewise a proof that the Sanscrit was actually a living tongue, and was used in conversation by all educated people. This is proved by many other circumstances; and it would be a great mistake to view the Sanscrit as having become from this time merely a learned language. On the contrary, it was the language of the court of Cashmere as late as the 12th century A.D., and was probably in use in the small independent courts of Rajpootana even in the 14th and 15th centuries. It is consistent with all that we know, that the language should be in a different condition in the different provinces of India. The Mohammedan conquest however gave the final blow to the language, and it is now used only in learned disputations in the colleges of the Brahmins.

Literature.—The Sanscrit literature begins with the Vedas, and is founded entirely upon them. [VEDAS.] The rest of the literature may be divided into the poetical and the scientific. The poetical literature may be referred to two distinct periods, one of which is chiefly distinguished by the composition of the great epic poems, and the other may be characterised as the period of artificial poetry. In the former, the interest is a national one, and arises from the subject; in the latter, it depends upon the form.

Epic Poetry.—We possess the epic poetry only in its most perfect state, and consequently its origin is involved in obscurity, and must be looked for among the rhapsodists, whom the 'Râmâyana' presents to us pretty much in the same character as that in which they appear among the later princes of India. The materials of the epic consisted primarily of the genealogies of the princely families whom the rhapsodists served, and next, of certain prominent events in the family history, which were at [illegible] afterwards incorporated in the [illegible] therefore that there may have [illegible] there were princely races. In [illegible] of [illegible] all these poems have been lost except [illegible] debted for their preservation partly [illegible] and still more to the interest of the [illegible] 'Râmâyana' and the 'Mahâbhârata.' [illegible] undergone many important alterations [illegible] the hands of the authors; in fact, the[illegible] remodelled in accordance with the in[illegible] of [illegible] by the addition of those parts in wh[illegible] originally no more than mortal he[illegible] tions of Vishnu; these additions howe[illegible] loosely attached, that they might easily be [illegible] detriment to the whole. In the 'Mahâbh[illegible] has been kept in view of including in [illegible] whole cycle of tradition; and as the ep[illegible] tended for the instruction and amusemen[illegible] caste, not only was everything added which [illegible] their reverence for the Brahmins, but t[illegible] books, of considerable length, in which th[illegible] cosmogony, philosophy, and law are explained [illegible] manner.

The Râmâyana.—The subject of the 'Râmâyana' is the descent of Vishnu, for the purpose of averting the threatened destruction of the whole world by the prince of the dæmons, Râvana. Râma, the son of Dasaratha, king of Oude, was brought up by wise Brahmins, especially Visvâmitra; while yet very young he overcame the dæmons in several battles, and by his superhuman strength obtained the hand of the beautiful Sîtâ. He was about to be appointed successor of his aged father and to be his partner on the throne, when the plan was frustrated by a court intrigue, and he was compelled to wander abroad as an exile. With Sîtâ and his brother Lakshmana, who also participated in the divine nature of Vishnu, he dwelt in the inhospitable wilds of the Deccan, in the forest of Dandaka, at the sources of the Godavery. This course of events was necessary in order to bring him and Râvana together, for here Râma made himself terrible to the dæmons, and having mutilated, among others, Sûrpanakhâ, the sister of Râvana, the dæmon-prince, partly out of revenge for this outrage, and partly inflamed by violent love for Sîtâ, carried her off, and brought her in safety to his residence at Lankâ (Ceylon). Râma and Lakshmana, unacquainted with the abode of Râvana, wandered about in the peninsula in search of Sîtâ. The ape-king Sugrîva, who had been dethroned by his own brother Bâli, was restored to his kingdom by Râma, and from a feeling of gratitude sends out a host of apes for the purpose of finding the abode of Sîtâ. The ape Hanumân at length discovers it, passes across the strait, seeks out and speaks with Sîtâ, sets fire to Lankâ, and conveys the intelligence to Râma, who proceeds with the whole army of apes to the southern point of the peninsula, when an enormous bridge is formed by throwing mountains into the sea. As the army is about to march upon the island, Râma is encountered by Vibhîshana, Râvana's brother, and a Titanic conflict commences, the description of which is one of the most admired parts of the poem: but the dæmons are at length subdued; Râvana falls by the hand of Râma; and Sîtâ is recovered, and having been found pure, as well by the ordeal of the gods as by the word of Brahma himself, she is again united to Râma, who, returning to Ayodhyâ, receives from the hand of his brother Bharata the dominion to which he is entitled.

These are the contents of the first six bo[illegible] poem terminates. But there is a [illegible] obviously a later addition, and con[illegible] entirely independent of the former narra[illegible] separated from Râma, and bears two [illegible] to Vâlmîki. After her innocence [illegible] blished, she is carried away by the g[illegible] and Lava have learned the poem from V[illegible] logical author, and recite it at a great [illegible] whereupon Râma acknowledges t[illegible] is obviously an etymological myth, [illegible] scrit name of the rhapsodists, *kusîlava*[illegible] the present introduction to t[illegible] first bo[illegible] origin of the poem is told in the [illegible] way, and [illegible] must therefore be regarded as [illegible] editor. That the 'Râmâyana' has [illegible] alterations, may easily be shown. [illegible] ts, many things which point to very antient times; but customs introduced at a later period are not even alluded to, as for instance the burning of widows, which was practised in the age of Alexander. In other parts circumstances are referred to which bring us as far down as the second century A.D., the names of comparatively recent nations being mentioned, for instance the Huns.

The time of the composition of the poem cannot therefore be ascertained with any further degree of accuracy; and all minuter investigations must be deferred until the whole poem is printed. It is more easy to determine what historical fact forms the foundation of it. This is evidently the introduction of the Brahminical worship into the Peninsula, the wild aborigines of which, as being the opponents of Brahminism, are made to appear in the character of dæmons. The apes must represent another and a less hostile race, whom the Brahmins made use of in order to overcome the ruder tribes. This fact is indicated by another circumstance in the poem: the guide of Râma is the hermit Agastya, to whom tradition ascribes the conversion and cultivation of the Deccan, and who even now shines, according to a sublime symbol, as the radiant Canopus of the South.

The 'Râmâyana,' since the last re-casting of the poem, has undergone several revisions, of which we have become acquainted with three, or at least two, by means of MSS. That which contains the oldest and the best text is confirmed by commentaries; another, which we have from the later Bengalee critics, may almost be called a paraphrase. Cary and Marshman first commenced an edition (Serampore, 1806-10, 4to., 3 vols.) which contains the first two books, with an English translation. The text is founded on these two revised copies. A. W. von Schlegel is engaged upon a critical edition of the Râmâyana, founded on a comparison of the MSS. existing in Europe, in which the text of the commentators has been restored. Two volumes of the text have been published, and the first volume of an extremely elegant Latin translation (Bonn, 1829, 8vo.).

Mahâbhârata.—For the second of the two great epic poems, see the article MAHABHARATA.

Laws.—To the same period of literature belong the law-books, the *Sâstras*, among which that of Manu has obtained the highest reputation. [MANU.] Besides the book of Manu, there were many similar books, which were likewise referred to sacred mythological personages, as Vishnu, Vrikaspati, Nârada, and others. All of them have been put in shape in the course of time, and this has been done contemporaneously, for the several works contain references to and quotations from one another, and their contents do not materially differ. The 'Yâjnavalkya Sâstra' still exists in the commentary (the 'Mitâxara') which was written upon it; and indeed the original work might be tolerably well restored from it. The 'Mitâxara' quotes numerous passages from the 'Gautamasâstra,' another work of the class, which may still probably exist in India in a complete state.

Purânas.—The Purânas, if we regard the form, must be classed with the antient epic. They are voluminous collections of legends and traditions, written to elucidate the origin and history of some particular holy place or a certain t, and to be read to the people for their instruction at the great festivals. They all begin with a cosmogony, to which they add the genealogy of the gods and the development of the periods of the world, as well as unconnected historical traditions, so as to form a fabulous chronology; and thus they come down to the history of the sacred place to which they are especially dedicated; they then conclude with the acles, and so forth, which have been performed there. As they were intended to be read publicly, they are of course used as vehicles for conveying such instruction as the people might be presumed to require. They contain therefore not only recommendations to devotion and faith, and copious representations of the religious usages and customs, but also systems of the sciences which were known to the natives of India, as astronomy, mensuration, and jurisprudence, which are different in each Purâna, according as the priesthood of a temple belonged to this or that sect, or to this or that school of philosophy, astronomy, or law. In their present form the Purânas are decidedly very late compositions, but the elements out of which they have been constructed belong to very different periods. They themselves refer to still older sources, and all the circumstances combined lead to the conclusion that there must have been another set of Purânas, which are now lost, and of which the present are an altered form or an imitation. Their great similarity, as well in their general structure as in particular parts, shows that they must have been formed upon one type, and that one very antient, and that the differences which they present arise from the difference of object, according as they emanated from this or that place, or this or that sect. The older authorities actually give definitions of the Purânas which do not apply to them as they exist at present, and which presume an older form. It may even be asserted that entire portions of them must originally have belonged to the Vedas. In their present shape none of the Purânas can be referred to an earlier date than the ninth century A.D.; and the greater part of them are much later, and closely connected with the formation of the more recent sects. Though they are metrical compositions, they have no pretensions to poetic merit, if we except the 'Bhâgavatapurâna, which was probably written by Vopadeva. They are arranged according to a certain canon, and are eighteen in number, under the titles of Brâhma, Pâdma, Brahmânda, Agni, Vishnu, Gâruda, Brahmavaivarta, Siva, Linga, Nâradîya, Skanda, Mârkandeya, Bhavishyat, Mâtsya, Vârâha, Kaurma, Vâmana, and Bhâgavata. Besides these, there are said to be eighteen *Upapurânas*, or secondary Purânas, but the actual existence of these Purânas is somewhat doubtful. There are many others, not included in this canon, which are called *Sthalapurânas*, or local Purânas, and are of little importance. The Purânas have been chiefly made known to us by the analyses of Wilson, in the 'Asiatic Journals' of Calcutta and London, by his translation of the 'Vishnupurâna,' London, 1840, 4to., and by Burnouf's edition of the 'Bhâgavata,' vol. i., Paris, 1840, fol. The 'Bhâgavata,' with the scholia of the 'Srîdharasvâmin,' has also been printed (Calcutta, 1834).

Artificial Poetry.—Sanscrit poetry received a new character, and one essentially different from that which we have been just considering, in consequence of the revolution which took place in Sanscrit literature about the first century before Christ. Instead of the popular and national character which appears in the two great epic poems, it now assumed an artificial form, and became the poetry of courts and princes. How this was effected cannot be historically shown, for the various steps of the transition are lost, and the new poetry appears at once in its perfect state. It is however quite obvious that the two great epic poems had long been completed and were in universal repute. The new poetry is poor in invention, and drew its materials from the former. Its whole merit consists in what may be called style. Even the epic versification is for the most part neglected, and lyric metres are substituted for it. This is not merely a difference in external form, but it is connected most intimately with the mode in which things are viewed by the Indians, who, being devoted to contemplation, delight to work up their poetical materials not so much into a continuous action, as into a series of single situations. Each of these situations is exhibited in a single stanza or strophe, which forms an independent whole, and is not connected with the others either grammatically or metrically. This peculiarity is as obvious in the epic as in the lyric and dramatic poetry.

The *new Epic poetry* begins with Câlidâsa, to whom two works of this class have been ascribed, 'Kumârasambhava' and 'Raghuvansa.' [CALIDASA.] They are written in a style worthy of imitation, and their whole character shows that they are older than the others, from whose superfluities these early works are free. The materials belong to the mythic cycle of the 'Râmâyana.' The disposition to describe rather than to narrate is exhibited as well in single passages as in the whole. Whenever an opportunity occurs, long descriptions are introduced, such as pictures of natural objects, to which the old epic poetry was also inclined, but more sparingly, and only incidentally; here however they encumber the whole progress of the action. This is much more the case in the two following poems, in which the descriptions appear to the poet to be so important that he seems to have undertaken the works only for the purpose of introducing them. These are the 'Kirâtârjunîya,' or 'the battle of the Arjunas with the Kirâtas,' by Bhâravi, and 'Sisupâlabadha,' or 'the death of Sisupâla,' by Mâgha, both founded on episodes of the 'Mahâbhârata.' They are classical compositions and elaborated with the utmost nicety; but the art of the poet degenerates into a mere play upon words: there are verses which may be read forwards and backwards, and upwards and downwards; others in which only one and the same consonant is used (as 'Sis.

19, 114, 'dâdado duddaduddâdî dâdâdo dûdadîdado duddadan dadade dudde dudâdadado dada,' which indeed is not very clear, but still has a meaning), or two consonants or more are used. These poems were printed at Calcutta, 1814, 1815, with the commentary of Mallinâtha. The 'Bhattikâvya,' written in the fifth or sixth century, in Vallabhî, the chief town of Guzerat, narrates the history of Râma, but only for the purpose of elucidating the more rare grammatical forms, every canto being written in a certain tense, &c. (Published at Calcutta, 1828, with two grammatical commentaries.) The 'Nalodaya,' falsely ascribed to Câlidâsa, gives the history of Nala out of the Mahâbhârata, but only to show the skill of the poet in an incessant play of words and rhymes. The most artificial of all these poems is the 'Râghavapândavîya' of Kavirâja. It is written with such a purposed double meaning, that the same words give us the histories of Râma and also of the sons of Pandu, which is only possible in consequence of most of the Sanscrit proper names having also a perfect appellative meaning, so that in the one history the proper names must be dropped, and in the other the appellative meanings. This poem has not yet been published. We shall mention in the last place the 'Naishadîya' of Srîharsha, king of Cashmere in the twelfth century. It treats of the marriage of Nala, and nothing else, in twenty-two long cantos, written throughout in a very artificial manner, which however makes it a great favourite among the Indians; the descriptions in this poem exceed in length and number all reasonable bounds, and there can hardly be said to be any action at all.

Lyric poetry, in the proper sense of the term, did not exist among the natives of India at this period, for even here their fondness for description has taken the place of everything else; and instead of lyric poetry, we have the epigrammatic, didactic, and descriptive. Even their amatory poetry appears to be not so much the expression and effusion of feeling, as a studied and laboured display of situations. An agreeable work of this description, the 'Amarûsatakam,' consists of 100 single small poems, each of them being nothing more than a stanza which represents an amatory scene, and which we should call an epigram. (Published at Calcutta.) To this class belongs also the 'Sringâratilaka,' which has been improperly ascribed to Câlidâsa. To these must be added the first book of the 'Centuries' of Bhartrihara, while the two other books contain didactic poetry. The work has been ascribed to the brother of King Vikramâditya, who lived in the first century B.C., but improperly, for it belongs to a much later period, and indeed it is not an original work, but a compilation. (First edited at Serampore, with the 'Hitopadesa,' 1804; and at Berlin, 1834, by Bohlen.) Among the poems properly called descriptive, by far the best is the 'Meghadûta,' certainly a genuine work of Câlidâsa, which, in a style of the utmost elegance and simplicity, describes the course of a cloud over a part of India, the residence of the god of riches and of the wife of a demigod who had been banished to earth [CALIDASA]: the poem is put in the mouth of the demigod himself. The value of this poem as a work of art lies chiefly in this, that every single external phenomenon receives a spiritual meaning, and all nature seems to be endowed with life. It is very different in the later poems of this class, which are properly only rhetorical centos and collections of all the current expressions and comparisons of previous poets. A work of this kind on the seasons, a subject indeed which is frequently introduced in the epic poems, the 'Ritusanhâra,' has been improperly ascribed to Câlidâsa. (Printed at Calcutta in 1792, and at Leipzig in 1839.) A similar one on amatory common-places, 'Chaurapanchasikâ' (in Bohlen's 'Bhartriharis'), is bombastic and spiritless. This branch of literature must have been very rich, and many of the older works have undoubtedly been lost.

The Drama.—In the opinion of the natives the Indian drama had its origin in very antient times, as appears from the fact of their attributing the invention of it to the gods. We are unable to trace it historically, for we know it only in its perfected form. Thus much is certain, that its development is due to the sacred solemnities, and partly to the dances; and accordingly the technical name for drama, *nâtaka* (dance), still remains (though in the extant dramas there is no dancing): and partly to the puppets, which are still used in Java in the representation of pieces taken from the Indian mythology: a trace of this latter origin is preserved in the name of the stage-director, [illegible] signifies *thread-holder*.

Such performances are still retained in thei[illegible]
at the festivals of Râma and Krishna. The [illegible]
the pieces come forward one after ano[illegible]
accompanied with gesture. It is ob[illegible]
able time must have elapsed be[illegible]
could have grown into a regular [illegible]
action, in which mythological, and [illegible]
torical materials are interwoven i[illegible]
But the Indian drama, even in its [illegible]est
a low condition. Among the Gre[illegible]
dividual action and the collision [illegible]
moving forces of the drama; but t[illegible] In[illegible]
series of events and situations which
cession to the spectator. The distin[illegible]
and comedy is unknown, and the India[illegible]
resembles the modern opera. The In[illegible]
not yet arrived at the discrimination of [illegible]
and heroines resemble one another m[illegible] or l[illegible]
dramas; and the species rather than
everywhere represented. There are also [illegible]
ters, such as the *vita*, who is the [illegible]
stage, and the *vidûsthaka*, who is [illegible]
lish. This latter personage is a [illegible]
of the principal hero, whom he [illegible]
wishes he contrasts with his own [illegible]
contrasts are often very strongly co[illegible]
the Greek drama are unknown to that of I[illegible]
many external particulars it is compar[illegible]
as for instance in the number of acts, o[illegible]
be as many as ten. In the form there [illegible]
which especially require notice: first, [illegible]
dialects in the dialogue, which is in [illegible]
delicately managed, and gives us [illegible]
cultivation of the Indians in [illegible]
ready been observed that the
the women and inferior cha[illegible]
Pracrit); and, second, the intercha[illegible]
The dialogue is entirely in prose, [illegible] is i[illegible]
verses in the lyric metres, always of [illegible]
before mentioned, which [illegible]
situation, and sometimes [illegible]
be actually represented on the st[illegible]
of a vehicle. As to the scenic [illegible]
tion is limited. It may be in [illegible]
books that great care was bestowed [illegible]
and the costume, but the [illegible]
rations appear to have been very [illegible]
literature of India is beyond all doub[illegible]
are yet aware of. The names of abou[illegible]
to us, of which 10 have been edi[illegible]
Professor Wilson for longer or [illegible]
('Theatre of the Hindus,' 2nd e[illegible]
nately the pieces which have b[illegible]
to enable us to take a rapid view [illegible]
sions of this branch of their literature.

The classic age of the Indian dra[illegible]
three periods: the first includes [illegible]
of which only one piece remains. '[illegible]
Toy-Cart,' by King Sûdra. It is [illegible]
piece belongs to the early period [illegible]
contend with materials which he does [illegible]
to handle. There is a certain clu[illegible]
ment of the acts and scenes, and [illegible]
poetry is fatiguing, a whole act, for inst[illegible]
with the description of a storm. In [illegible]
strikingly original, and contains few [illegible]
which occur in the other po[illegible]: the d[illegible]
Pracrit also are more clo[illegible]
pieces. To Europeans [illegible]
as giving a representation of In[illegible]
be found in any other work. T[illegible]
ing piece of this period, many othe[illegible]
Câlidâsa; for the general theory o[illegible]
ready perfected, which is obvious [illegible]
to it.

The second period begins with [illegible]
the Indian drama reached its high[illegible]
have two pieces by him, 'Sakunta[illegible] Vikr[illegible]
LIDASA], of which the last has been [illegible]
judge from the style and spirit, i[illegible]
to him. Câlidâsa is indeed the

dramatists, for in his pieces we have the utmost elegance of style, without anything over-laboured or artificial; the development of his plot is natural and well considered; and there is always a correct relation of parts. As to his poetical merit, Europeans have been enabled to form a judgment from the translation of his 'Sakuntalâ,' by Sir William Jones.

The third period begins with Bhavabhûti, at the commencement of the eighth century, whose æra is established by a passage in the 'Chronicle of Cashmere.' Dramatic poetry had now undergone a great change, the historical progress of which we are unable to describe for want of the necessary evidence. Bahvabhûta was a learned poet, who constructed his works entirely according to the dramatic theory of previous writers. He has accordingly a very high reputation in India, but he has all the faults consequent on the direction thus given to his genius. With all his poetic talent, he is deficient in true dramatic spirit; his results are laboured, and there is always a display of art and a want of nature. Description is with him always in excess, and the diction of single passages is not only too artificial, but also pompous, and to Europeans therefore not without difficulty. There are three pieces of his; one in which a domestic subject is treated, the loves of Mâlati and Mâdhava, and two others taken from the cycle of traditions of the Râmâyana, 'Mahavîracharitra' (which has not been printed), and 'Uttararâmacharitra.' The last is most free from the excessive elaboration of style.

As specimens of dramas of intrigue in the Indian style, 'Ratnâvali' and 'Mâlavikâgnimitra' are worthy of notice. The first was written in the twelfth century by Srîharsha, king of Cashmere, or under his name; the other was probably prior to Bhavabhûti. The plan of these pieces is not unskilful, and the language is easy and graceful; the subject itself warning the poet to avoid a highly ornamental style. Another kind of interest belongs to the 'Mudrârâkshasa' of Visâkhadatta; the exact time to which this drama belongs is unknown, but it is certainly after Bhavabhûti; the matter is historical, namely the history of Chandragupta, the Sandrocottus of the Greeks. In the deficiency of historical information, even such a tradition is important, and the piece also throws much light on the politics of the Indian courts. As a drama it is not of much value; it is mostly written in prose. The 'Prabodhachandrodaya' ('the rising of the moon of reason') is of a character quite peculiar: it is an allegorical play, written by Krishnamisra in the twelfth century, in which purely abstract ideas, as virtues, passions, and crimes, are personified and act, and by means of whom the Vedanta philosophy at last celebrates her triumph. Setting aside the strangeness of such a work of imagination, it must be admitted that the author has performed his task with great skill.

It was much later before the peculiar species of drama made its appearance which is called *prahasana* (*comedy*, or rather *farce*). The pieces are short, and are valuable as exhibiting an entirely new kind of literature. They are bitter satires, as unrestrained as those of Aristophanes, and aimed at the deep state of degradation into which the Indians had sunk, chiefly through the corruption of the Brahmins. The 'Dhûrtasamâgama' ('the assembly of rogues') is a playful wrangle between a Brahmin and his scholars about a courtesan. The piece has the merit of parodying in a happy manner the bombastic style of Bhavabhûta, which is a proof that even in India there were critics who were opposed to the common opinion, and who ridiculed the perverseness of the general taste. This little piece belongs to the end of the fifteenth century. (Published in Lassen's 'Anthologia Sanscritica,' Bonn, 1838.) The later dramas confine themselves entirely to mythological subjects. The greater number of the sixty pieces before mentioned belong to this class.

The 'Gîtagovinda' of Jayadeva, written in the twelfth century, is entirely different from the works already described. It is a poem intended for performance at a festival of Vishnu, and belongs to that class to which we ascribed the origin of the drama. It exhibits the separation of Krishna from his wife Râdhâ, his love-adventures with the shepherdesses, and the reconciliation of the husband and wife, in a series of songs, which are connected and introduced by strophes which describe the situations. The strophes were intended for recitation, the songs to be sung. This is therefore the only Sanscrit poetry which we possess that can properly be called lyric. But the songs are entirely written on the model of the Pracrit songs, which alone appear to have been intended for singing, and they have throughout the Pracrit metres. The word *govinda* itself is a Pracrit form of the word *gopendra*, 'the master of the shepherdesses,' which is one of the titles of Krishna. The scholiasts explain the poem in a mystic sense: Krishna is the soul, which emanated from God, with whom it was originally in union, but was drawn down from him by sinful objects (the shepherdesses); at length however, full of desire for its original purity, it returns to God. In fact, the author himself, in certain passages, seems to intimate that he had some such deep meaning in view: and perhaps we may here find indications of the influence of the mystic poetry of Persia. (Printed at Calcutta, 1806; and there is an excellent edition by Lassen, Bonn, 1836, 4to.)

Narratives.—As the old epic poems were especially designed for the warrior-caste, so the Vaisyas, the third class, have a literature of their own, the *narrative*, of which the first which requires notice is *Fable*, which is indigenous to India. In the 'Râmâyana' and in Manu there are allusions to well-known fables, and others are related in the 'Mahâbhârata.' The two chief works of later times, but which are still of some antiquity, are the 'Panchatantra' and 'Hitopadesa.' [BIDPAI.] The 'Kathânakâs' are short narratives and tales. They are known to us chiefly through three modern prose works, which contain obvious marks of having been derived from older metrical collections. They are called—'Vetâlapanchavinsati,' 'the 25 tales of the ghosts,' by Sivadâsa; 'Sukasaptati,' 'the 70 tales of the parrots,' known in Europe as the 'Tutinameh,' from a Persian translation; and the 'Sinhâsanadvâtrinsati,' 'the 32 tales of the statues on the throne of Vickramâditya.' The whole series has only been printed in translations into the modern languages of India. Lassen has published part of the Sanscrit original in his 'Anthologia.' But there is another still more important work, a great collection of all the existing tales, which was undertaken by Samadeva of Cashmere in the twelfth century; it is entitled 'Vrihatkathâ,' 'the great narration,' or 'Kathâsaritsâgara,' 'the ocean of the streams of narrations.' It is written in the epic metre, and in a simple style. (About a fourth part of the work has been published by Brockhaus, Leipzig, 1840.) Viewed with reference to their matter, the works of this collection are peculiarly interesting to us, since even in the middle ages they had found their way to Europe under various forms, as 'The Book of the Seven Wise Masters,' &c.; and the knowledge of the original text clears up many difficult questions of literary history. Some of the oldest and best of the 'Tales of the Thousand and One Nights' have been drawn from this source, and even in the Arabic version they retain many features which belong only to India.

There are two other kinds of narrative works, which need only be noticed briefly, as no part of them has been printed the *champûs*, which are narrations in prose and verse, sometimes written in the artificial style; and the *charitras*, which are short and wonderful stories from the history of some celebrated man. Of this last kind there are two which relate to the kings Vikramâditya and Bhoja, and at first sight appear to contain some valuable information; but they are entirely without authority, and have only served to introduce error into questions of literary history.

Before we proceed to the scientific literature, we must add to the narrative class the scanty remains of

Historical Literature.—The peculiarly contemplative cast of mind which distinguishes the natives of India, and the circumstance of the whole country having never been formed into a single kingdom, but consisting of small independent governments, will sufficiently account for the almost entire want of historical writings. With the exception of a very modern chronicle of Orissa (abridged by Stirling, 'Asiat. Resear.,' xiv.), there is only one historical work in existence in the Sanscrit, 'The Chronicle of Cashmere,' properly entitled 'Râjataranginî,' 'the stream of the kings;' it was written in the twelfth century by Kalhana, partly from antient sources, which he specially mentions. There have been three successive continuations of this Chronicle, which describe the period of the Mohammedan dominion down to Akbar. The work is written in the artificial style, in the epic metre, and has a good deal of the form of a 'Purâna.' The first part of it has been drawn almost entirely from Buddhist sources. It was first made known in Europe by Wilson's Analysis ('Asiat. Resear' xv.); afterwards edited at Calcutta, 1835, 4to.; and lastly, the first six books, with a French translation by Troyer, were published at Paris in 1840 The Buddhists, on the other hand, have a history, chronologically worthy of credit, which is continued according to the series of their patriarchs. Hitherto the only publication of the original Indian text has been that of the 'Mahâvansa,' in Pali, by Turnour. (Colombo, 1837, vol. i., 4to.) This deficiency of historical literature is in some degree compensated by numerous inscriptions of various ages, which have been found in all parts of India, but of which hitherto very few have been deciphered and published. As most of them contain genealogies and other matters which indicate the time when they were written, they are of inestimable value for historical inquiries, being almost the only documents which we possess. As to any other historical notices, we are entirely indebted to the writings of the Greeks, the Chinese, and the Arabians, which have been very useful, at least for settling dates.

Scientific Literature.—The sciences to which the natives of India have been original contributors, are philosophy, grammar, and astronomy, together with algebra.

Philosophy is of great antiquity in India. The contemplative character of the natives must have early led them to metaphysical speculations, and the collision which must soon have occurred between the results of those speculations and the revealed word of the Vedas, would become a principal cause of the wider extension of philosophy. Hence arose many systems; of those which are held to be orthodox we are specially acquainted only with six; but as these six are related to each other by twos, they can only be regarded as three distinct systems. We are acquainted with them only in their complete form, in which they have a mutual relation to each other, and we are not able to point out their historical development.

The *Sânkhya* system however must be regarded as the first and most antient, and this system, on certain mythological grounds, has been traced back to Kapila. It is founded on a duality of soul and matter (or nature); the first being the free, pure, uncreated, and uncreating principle; the second, the creating power of nature, blind and purposeless. The one cannot be thought of without the other; they form for themselves the yet undeveloped being, and from them proceeds, by a regular gradation, from the spiritual to the intellectual, and then to the most corporeal, the whole visible world. Every human being indeed possesses the spirit, but in union with the senses; and his task is, by the conquest of the senses through the medium of the intellect, to attain to the final deliverance, 'moksha,' or blessedness, which is accomplished in the 'jnâna,' that is, the 'gnosis,' knowledge. But this system had an appearance of atheism, and therefore underwent a reformation in the *Yoga* system of the Pâtanjali. It is here established, that knowledge is the way to attain to the final deliverance, but knowledge itself can only be obtained through 'yoga,' absorption into God and mystical union with him, and a perfect abstraction from everything which can disturb the mind or awake the passions. The system further assumes, that the pure spirit is the creator, and thus it connects itself with the notions which belong to religion; it also adopts the metempsychosis, inasmuch as it fixes degrees of the yoga; the spirit comes back to inhabit new bodies till it has attained the highest degree of the yoga. The Vedas are also held in esteem as means of knowledge, but they are not valued more highly than other means, since a man is to perform what is said in the Vedas freely, and not merely on account of the written word. Hence has arisen the saying, that the 'yogin' is exalted above the Vedas.

The doctrines of the Buddhists are founded on the Sânkhya system, which they carry out into all its consequences, both in their religion and politics. [BUDDHA.]

The second system is the *Nyâya*, of which Gotama is the author. This system is entirely confined to logic and dialectic, on which it has been constructed even in the most minute particulars. It is therefore more in accordance than the Sânkhya with the other systems; and as the natives of India generally have bestowed much labour on the study of logic, so philosophers also of all the different sects have occupied themselves with it. The number of the Nyâya writings is very great. The *Vaiseshika* system may be looked upon as a reformation of the Nyâya. It is derived from Kanada. It applies the logical principle to nature, and has arrived at a complete atomic doctrine by the resolution of all substances into their elements. It asserts that there is a union of atoms, which however is [illegible] that, contrary to the Sânkhya, in its [illegible] sarily leads to materialism.

The third system, the *Mimânsâ*, the first teacher of [illegible] was called Jaimini, is directly opposed to the two [illegible] It maintains religion and the revealed word of [illegible] and is a positive theological system. Acco[illegible] pied chiefly in commenting upon the Vedas, [illegible] ing their contradictions. The first part of [illegible] predominantly practical; it is called 'Pûrvamimâ[illegible] first Mimânsâ;' here also it is affirmed that the fi[illegible] ance must be worked out by knowledge, but it [illegible] knowledge to that of the duties pre[illegible] in [illegible] The metaphysical part of this system [illegible] *Uttaramimânsâ*, commonly called the *Ve*[illegible] knowledge is considered as the condition of de[illegible] but still the sacred word of the Vedas is the [illegible] which all thought is to be regulated. The Ve[illegible] philosophy and dialectic, and has therefore [illegible] the other systems everything not contradictory [illegible] the consequence of which is, that one-half of [illegible] is given up, and the Vedânta is intermediate [illegible] losophy and dogmatism, as was the case [illegible] system of the schoolmen. It has been however [illegible] service in the later corrupted times, in [illegible] religious and political system, and in [illegible] present time. The two greatest restorers of this [illegible] Kumârilabhatta in the sixth century A.D. [illegible] chârya in the seventh and eighth, both of [illegible] largely to the expulsion of the Buddhists. [illegible] velled through the whole of India, comb[illegible] the opposite sects. The system is indeb[illegible] perfection, and it is even now universally [illegible] out India in the form into which he broug[illegible]

The heterodox systems are chiefly known to us [illegible] the refutations of them by their opponents, [illegible] karâchârya, for the writings themselves [illegible] tentionally destroyed. They are alluded to [illegible] and they are combated in the 'Râmâ[illegible] proofs of their antiquity. The most imp[illegible] is that of the *Lokâyatikas*, a connected [illegible] development of the *Vaiseshika* doctrine, and [illegible] rialism. Those who adopt this system do [illegible] a final deliverance as the highest aim, b[illegible] existence, and regard the soul as a materia[illegible] only source of knowledge is considered to be [illegible] perception by means of the senses; and [illegible] to be uncreated and eternal; they conse[illegible] first cause of things, and are perfect athe[illegible]

(Colebrooke, 'On the Philosophy of the [illegible] vol. i., 'Sankhyakarikâ,' edid. Lassen, [illegible] ed. Wilson, London, 1839, 4to.; 'Bhagava[illegible] Bonn, 1823; 'Nyâya Sûtra Vritti,' Ca[illegible] 'Bhâshâ Parichheda and Siddhânta Mukt[illegible] 1827, 8vo.; 'Vedântasâra,' by Sadananda, [illegible] 8vo.; 'Sarîraka Mimânsâ Bhâshya,' by S[illegible] Calcutta, 1829, 4to.; 'Sankara, sive de [illegible] Vedanticorum, auct. Windischmann,' Bonn, [illegible]

Grammar.—The *Philological Sciences* ari[illegible] antient people as soon as a sacred literature [illegible] to their growth. The Vedas were written in [illegible] which soon became obsolete. The necessity o[illegible] them against corruption and innovation, and of [illegible] their correct interpretation, naturally led to [illegible] inquiries; and as the Sanscrit language is in it[illegible] ginal, regular, and perfect, that its laws are [illegible] covered, philology has become the most valuable [illegible] dian literature. The Indian grammarians a[illegible] those of any other antient people; and they have [illegible] predilection for this science, and have tr[illegible] of [illegible] berless writings. The first beginnings of [illegible] reach back to very remote times, and [illegible] collected system of the Vedas. The [illegible] appear also as the authors of the 'Upanishads [illegible] we are unable to trace the gradual [illegible]mation of the [illegible] the system appears at once in its [illegible] 'Sûtras,' or Aphorisms, of Pânini, [illegible] middle of the fourth century before [illegible] of a series of older grammarians, as well as [illegible] though in certain particulars there was a [illegible] what they taught, yet in general the system [illegible] and they had the same technical terms. The [illegible] grammar is presented is one peculiar to the [illegible] dia, and they apply the same principles to other sciences, as for instance philosophy. Everything is compressed into rules, which are brought into the most concise forms of expression possible, and the grammatical categories are expressed by a kind of figures or algebraical signs. They are intended to be committed to memory, and without a commentary they are unintelligible; they are all connected one with another. Pânini is not systematic, but indeed very arbitrary in his arrangement, which appears to have been adopted merely from the necessity which the object of attaining the greatest possible brevity imposed upon him. The whole of more modern Sanscrit grammar is founded on Pânini, and at first grammarians were merely occupied in explaining and correcting him. Two antient commentaries by Kâtyâyana (who is also called Vararuchi) and by Pâtânjali, who in later times have themselves been copiously commented upon, are as old as Pânini himself. In comparatively recent times, grammarians began to take some pains to reduce the 'Sutras' to a system, and to compose grammars more in accordance with European notions. Here the 'Siddhântakaumudî' must be particularly mentioned, which was written by Bhattojidîkshita about the year 1600, and has served as the foundation of a number of more modern works. ('Siddhântakaumudî,' Calcutta, 1812, 4to.; 'Laghukaumudi,' ibid., 1827.) All these are entirely occupied with teaching the grammatical forms, and it is only as opportunity offers that they give a few syntactical rules. Syntax, on the contrary, is developed in many distinct works, and is grounded on the logic of the Nyâya system, which is a proof of enlarged and correct views. So in like manner the different Pracrit dialects have been exhibited in their separate grammars. The oldest work of this kind is the grammar of Vararuchi, which belongs to the fourth century before Christ (the greater part of it published in Lassen's 'Instit. Linguæ Pracr.'); it treats of the principal dialect and of the three others which are most nearly connected with it. He is followed by a series of later grammarians, who successively include within the limits of their works more of the inferior dialects. The most important of these grammarians is Hemachandra, a Jain. The canonical books of the Jains being written in the Pracrit, that language is regarded by them with peculiar interest.

Lexicography also had its origin as far back as the Vedas, for the necessity must soon have been felt of collecting and explaining the obsolete words. A work of this kind, entitled 'Nirukta,' forms an essential part of the Vedas themselves. For the purpose of perfecting grammar, it was afterwards found necessary to make alphabetical lists of the verbal roots. The nouns, chiefly for the purpose of fixing the genders, were arranged by themselves, not alphabetically, but according to the subjects to which they belonged. The chief work of this class, which has served as a foundation to all the later ones, is the 'Amarakosha' ('Amarasinha'), which they have imitated even in their arrangement. [AMARASINHA.] None of these works, of which there are many, completely exhausts the treasures of the language.

Metre.—In like manner, the *Veda-hymns*, which were to be committed to memory, led to the consideration of the laws of metre, and treatises on metre have been ascribed to very early teachers of the Vedas. Here also the more early essays have been superseded by a work which exhibited the subject as a complete system. Pâtânjali, who is here commonly called Pingala, is said to be the author of it: this work has been elucidated by numerous commentaries.

Music.—The theory of music has also been elaborated according to various systems, but in a strange manner, for the different notes and musical scales have been personified.

Of the metrical and musical sciences nothing has been printed, but this deficiency is supplied by Colebrooke's copious Treatise on Metre (*Asiat. Res.*, x.).

Rhetoric.—To the philological sciences belongs also the Indian system of *Rhetoric*, or rather *Poetry*, in which the rules for poetic composition are deduced, not from any principles of art, but from the existing classical works, with particular reference to the drama, the theory of which is extremely copious, and goes into the nicest distinctions. This theory belongs to a late period. There have been printed the 'Kâvyaprakâsa,' by Manmathabhatta of Cashmere (Calcutta, 1823), and 'Sâhityadarpana,' by Kavirâja (Calcutta, 1828), both of which belong either to the twelfth or thirteenth century.

Commentaries.—In later times the Indian grammarians have occupied themselves in writing commentaries on the older works, particularly the classical ones. The most important of the scholiasts with whom we are yet acquainted is Mallinâtha, on the more modern epic poems, and Srîdharasvâmin, on the 'Bhagavadgîtâ.' The commentators have done good service in fixing and maintaining a pure text, especially in the great epic poems. A philological school was established in Bengal, upon a directly opposite principle, for they began to make editions of classical works, in which, most uncritically, according to European notions, they kept to the meaning, but took the liberty of entirely altering the expression. As we have before mentioned, they made such a recension of the 'Râmâyana,' as well as of the 'Sakuntala,' and other dramas. Vopadeva, a grammarian of this school, in a similar manner invented a new grammatical system, according to which he altered the technical expressions of Pânini, without in other respects varying in the smallest degree from his method. ('Mugdhabodha,' Calcutta, 1826.)

Astronomy.—The oldest Indian astronomical documents are the calendars which are annexed to the Vedas, and which, according to Colebrooke, belong to the thirteenth century B.C. They include a solar year of 365 days, and are so composed as to determine it correctly. Here also we are unable to point out how the mathematical and astronomical sciences were gradually developed from such simple elements, as we possess them only in their perfected form. Assisted by the system of notation which they discovered, the natives of India have been particularly happy in their methods of treating arithmetic and algebra, which have had such influence on their mathematical studies that they prefer solving geometrical questions analytically, just as the Greeks, on the contrary, solved arithmetical questions by geometry. ('Lilâvatî,' by Bhâskara, Calcutta, 1828; Colebrooke, 'Algebra of the Hindoos,' Calcutta, 1817, 4to.)

In the earliest works on Indian astronomy now extant, several different systems are apparent, and these systems have been treated of in five works, entitled 'Siddhântas,' which apparently contain the same theories which were afterwards successively extended and improved. Varâhamihira, at the beginning of the sixth century A.D., compared them with each other, and other astronomers worked them up again under different titles, each with the view of introducing into them his own theory. The most important of all these astronomers is Aryabhatta, who was the first to free himself completely from all mythological notions; he was acquainted with the motion of the earth about its axis, and estimated more accurately than Ptolemy the precession of the equinoxes. His two works, 'Ariâshtasata,' an exhibition of his system in 800 strophes, and his abridgement of it, 'Dasagîtaka,' are only known to us by quotations. The age in which he lived is not accurately fixed. According to Colebrooke's reckoning, which seems very probable, the latest period at which he can be fixed is 478 A.D., and he may have lived two or three centuries earlier; but Whish ('Trans. Asiat. Soc., iii. 2, 509), fixes the year of his birth about 502 A.D. To fix the date with certainty would be of great importance towards the settlement of the question which has of late been investigated with so lively an interest, whether the Indian astronomy was entirely native, or whether it was constructed with the aid of that of the Greeks, with which the Indians were certainly acquainted. At all events Aryabhatta made greater progress in algebra than the Greeks Astronomy has not been improved in India since his time; on the contrary, those who have come after him have not relinquished the false views consecrated by religion, but have endeavoured to defend them against him. This was chiefly done by Brahmagupta, the author of the 'Brahmasiddhânta,' in the seventh century A.D., who is the classical astronomer of the moderns, and whose track was followed by Bhâskara in the twelfth century, in his work 'Siddhântasiromani.' (Several discussions by Colebrooke in the 2nd volume of his 'Essays.')

Jurisprudence.—It was the chief business of jurisprudence to determine accurately the contents of the antient law-books and to complete them. This was done partly by commentaries (especially Kullûkabhatta on Manu, and Paradatta on the 'Yâjnavalkya'), and partly in special works, which for practical purposes must have soon superseded the imperfect and unsystematic 'Sâstras.' The wants of the present age have occasioned the printing of a small number of these works, chiefly on the law of inheritance and adoption, and on procedure; others have been translated into English. Besides Manu, which was translated by Sir William Jones, Colebrooke's 'Two Treatises of Inheritance' (Calcutta, 1810, 4to.), and his 'Digest of Hindu Law on Contracts and Successions,' 1797, which is translated from a modern compilation, particularly deserve mention.

Medicine.—There are many Indian works on medicine, and the systems are various. Many parts of the medical science of India are valuable even to us, as for instance the Materia Medica, in which they were much favoured by nature. The Indian physicians were highly esteemed by the Greeks. In surgery especially they have made considerable progress, and have even discovered and performed difficult operations, as for instance the restoring of noses. The most celebrated medical work, 'Susruta,' has been printed (Calcutta, 1835, 2 vols. 8vo.); and Ainsley, and more recently Royle, have done much to make known the Indian systems of medicine.

Natural History.—The observation of external nature still remains in a very low state among the natives of India, and they seem never to have made any progress even towards the commencement of a scientific system of natural history; at least no works of this kind are known.

Study of Sanscrit.—The Sanscrit language was for many years considered unattainable, but towards the close of the last century this study received a powerful impulse, partly from the necessities of the English government in India, and partly from a desire of knowledge among the learned of Europe. The study of the language having been once commenced, its progress was extremely rapid, the acquisition of it being much facilitated by the previous labours of native grammarians; and by the printing of a great number of their most important works, a large part of the literature became generally accessible, an advantage which the other oriental languages have not enjoyed. In India this progress has been connected with the names of Wilkins, Jones, Colebrooke, Wilson, and Prinsep. But Europe did not remain behind; and the rich collection of manuscripts in the possession of the East India Company in London, and that of the library of Paris, have been abundant sources, and perhaps more than sufficient to compensate for the peculiar advantages enjoyed by India. In England, the study of Sanscrit is most indebted to Haughton and Rosen [ROSEN]; in France, where it was chiefly introduced through Hamilton in 1804, to Chézy and Burnouf. In Germany however Sanscrit has experienced the most cordial reception, though, owing to the want of manuscripts, the study of it has been prosecuted under the greatest disadvantages. In that country, the knowledge of Sanscrit has been chiefly diffused by A. W. von Schlegel and Bopp, both of whom learnt it about the same time in Paris. The latter however has only had in view comparative grammar, a science which has been called into existence by the study of Sanscrit. But A. W. von Schlegel and Lassen have founded in Bonn a Sanscrit school, the object of which is a well-grounded and complete knowledge of the language as well as of the literature and antiquities of India. With what success this attempt has been attended, appears from a series of works which have already issued from this school, and which embrace the most varied branches of Indian philology.

SANSEVIE'RA, a genus of Liliaceous plants, found on the coasts of Western Africa, of Ceylon, and other Eastern islands, as well as of India, remarkable for the strength and fineness of the fibres of their leaves. The genus is characterised by having a corol-like funnel-shaped perianth, which has a long rather straight tube, a sexifid limb, of which the divisions are either spreading or revolute. Stamens six, inserted into the throat; filaments filiform: ovary three-celled; ovules solitary; style filiform; stigmas obtuse, obscurely three-lobed. Berry 3-celled, 3-seeded, or, from becoming abortive, 1-celled and single-seeded. The plants have a thick creeping root-stock, with radical equitant leaves, which are fleshy and often spotted; the stem-leaves are scale-like, and the flowers in racemes or thyrsi. They are easily cultivated and propagated in sandy loam in bark stoves.

Sanseviera zeylanica, a species found in Ceylon, has smooth oblong, acute, flat, and linear-lanceolate, channelled, glaucous leaves, which are shorter than the scape; the style as long as the stamens, the bracts equalling the peduncle in length. This, like some of the other species, is remarkable for the tenacity and fineness of the fibres of its leaves.

S. Roxburghiana is a species, according to Mr. Haworth, which was confounded with the former by [illegible] and which the latter has figured in his Cor[illegible] It has linear ensiform leaves, which are cha[illegible] subulate at the apex, green, and longer than th[illegible] Style as long as the stamens; the bracts minute. [illegible] burgh describes this plant, and says it is called [illegible] Sanscrit, and in Bengalee *moorba*, that in E[illegible] may be called bow-string hemp, and that it [illegible] commonly under bushes in the jungles in a[illegible] in the southern parts of India; it flo[illegible] May. In a good soil, and where the [illegible] watered, the leaves become three or four feet long, and [illegible]tain a number of fine remarkably strong white fibres, which run their whole length. The natives make their best bow-strings of these fibres, which are separated by the leaves being placed upon a flat strong table, when one end is pressed down with the foot, and the rest scraped with a piece of hard wood held in both hands. Forty pounds of leaves thus scraped yield about one pound of clean dry fibres.

The fibres may be applied to a great variety of uses. Dr. Roxburgh was inclined to think that the fine line called China grass is made of these fibres. As the plant grows readily from the slips which issue in great abundance from the roots, and as they require little or no care, Dr. Roxburgh recommended their cultivation in sandy soils. It has lately been proposed in Calcutta to try the fibre on a large scale for rope-making.

S. lanuginosa is a third species, found on the sands of Malabar, while S. guineensis is a species found along a great extent of the west coast of Africa, and which, from affording fibres which, like those of the Indian species, are fine and strong, has been called African bow-string hemp. This has been proposed as a substitute for and considered even superior to New Zealand flax. S. guineensis is distinguished by having uniform lanceolate leaves, the style twice as long as the stamens; the bracts only a third of the length of the tube of the corolla; the flowers sessile.

SANSON, NICOLAS, designated, by a writer in the 'Biographie Universelle,' the creator of geography in France, was born at Abbeville, December 20, 1600. [illegible] the same name,* being passionately fond [illegible] wished all his sons to cultivate that science. [illegible] responded best to his desire. He was e[illegible] Jesuits' college at Amiens, on leaving which [illegible] his family, and for a time devoted himself [illegible] study of geography. At an early age (b[illegible]cording to the *Biog. Univ.*), he laid down a [illegible] Gaul, superior to those of Ortelius and Ge[illegible] but he did not immediately publish it, [illegible] some authorities, it should be attributed to hi[illegible] perhaps, from not thinking it sufficiently corr[illegible]cation. Sanson married early, and applied [illegible]merce, to meet the claims of his family; but [illegible] time was devoted to his favourite studies, tha[illegible] became embarrassed, and, having suffered grea[illegible] ceded his remaining effects to his creditors, and [illegible] went to Paris, taking with him his map of [illegible] The talent displayed in this production, which was published in the year just mentioned, obtained for him the patronage of Richelieu, by whom he was introduced to Louis XIII., who took lessons in geography from him, and employed him as an engineer in Picardie. He soon went to his destination, examining the works of the towns in that province, and returned to Abbeville, where he superintended the repair of the fortifications. In 1638, Louis XIII. being in Picardie to direct the operations of the army, lodged, while at Abbeville, in Sanson's house, and displayed great regard for the geographer, who frequently accompanied him on his excursions, and had the honour of being several times called to the council. His duties as engineer did not diminish his zeal for geography, and he published many maps: [illegible] having disagreed with the person who managed [illegible] Sanson established himself at Paris, about 1640, to [illegible]tend their publication in person. Soon after this he received the brevet of geographer to the king, and a pen[illegible] of 2000 livres. He was also made a counsellor of state, [illegible] did not assume the rank and titles of that [illegible] his children should be induced to abandon the [illegible] favourite science. His incessant labours brought on ness, of which, after lingering nearly two years, he died at Paris, July 7 (or, according to the account in *La France Littéraire*, July 16), 1667.

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* The identity of name between the subject of this article, his father, and [illegible] eldest son, has led to some confusion. In Watt's 'Bibliotheca Britannica' some works of Nicolas Sanson *the second* are erroneously attributed [illegible] father.

T maps of Sanson are very numerous, amounting, it is to about three hundred; of which a great number were devoted to an accurate delineation of France. Though the services he rendered to geography were very important, he has been blamed for working too hastily, and not taking ient advantage of astronomical observations for the vement of his maps. He published many works to accompany his maps, and others on geographical subjects. a dissertation entitled 'Britannia, ou Recherches sur antiquité d'Abbeville,' 1636, 8vo., he attempts to prove that Abbeville is the Britannia mentioned by Strabo (iv., p. 190. Casaub.), and that she furnished the first colony ed in Great Britain, and gave her name to the country. On turning to Sanson's dissertation (p. 4), it appears that he misunderstood the original, which simply says that neither the people of Massalia (Marseille), nor those of Narbo and Corbilo, with whom Scipio conversed, could give him any information about Britannia. But 'this learned and curious dissertation,' as it is styled in the 'Biographie Universelle,' compels us to form a very low estimate of son's critical sagacity, though these (Narbo and Corbilo) were the chief cities in this part of Gaul. His Tables méthodiques' of the divisions of the dominions of Christian princes, engraved on about a hundred folio plates, were first published in 1644, and passed through eral editions. Sanson's map of antient Gaul was cked by a Jesuit, Father P. Labbe, who nevertheless copied largely from it without acknowledgment. This led a reply, in which the mistakes and plagiarisms of Labbe were exposed; but only a portion of the reply was published, he remainder being destroyed by Sanson in consequence of he mediation of the chancellor Seguier. His maps were collected into an atlas by his sons, and published in two o volumes, in 1693. In the *Bibliothèque du Roi* is preed a MS. dissertation by Sanson, in which he endeavours to prove that Boulogne was the Portus Itius of Cæsar. Boulogne, vol. v., p. 271.] There is a portrait of Sanson, engraved by Edelinck.

Sanson had three sons, all of whom followed in his steps. Nicolas, the eldest, was killed August 27, 1648, in defend- the chancellor Seguier from the fury of the populace, at the age of twenty-two. Adrien, the next son, succeeded his father as geographer to the king, and died in 1718. Guil- , the youngest, in concert with his brother, continued the publication of maps and geographical works, and died in 1703. Adrien was succeeded in the business of publication by his nephew, P. M. Sanson. (Chiefly from the *Biographie Universelle.*)

SANSOVI'NO, JA'COPO TATTI. This eminent artist, equally distinguished as sculptor and architect, was born at Florence in 1479. He was the son of Antonio Tatti, whose surname he afterwards exchanged for that by which he is now universally known, and which he assumed out of compliment to his master, Andrea Contucci da Monte Sansovino. Contucci had just returned from Portugal, where he had acquired great reputation as a sculptor, when Jacopo, who was then twenty-one years of age, became his pupil, and afterwards greatly surpassed him. His superior talent however was so far from exciting any jealousy, that it served only to increase his instructor's attachment to him. At this time Jacopo profited greatly by his intimacy with Andrea del Sarto. They almost pursued their studies in common, and both of them copied Michael Angelo's celebrated cartoon representing an episode of the war with Pisa. Becoming acquainted with Giuliano Sangallo, then architect to Julius II., he was taken by him to Rome, where his talents procured for him the notice of Bramante and other eminent artists, and also of the pope himself. He was probably indebted to Sangallo for his first instruction in architecture—an art which he did not begin to practise till some years afterwards, but in which he ultimately attained the highest distinction. On his return to Florence he produced his Bacchus, a chef-d'œuvre in modern sculpture, but now known only from drawings and copies, it having been destroyed by a fire that broke out (1762) in the gallery at Florence, where it had been placed. During his residence at this period at Florence, he had an opportunity of displaying his talents as an architect, in designing several triumphal arches, and decorating the front of the Duomo with a temporary façade adorned with Corinthian columns, niches, reliefs, &c., in honour of the public entry of Leo X. (1515), who complimented him by saying that the design deserved to be perpetuated in marble.

He returned to Rome a second time, but quitted it for ever on the city being taken and sacked by the Imperial troops in 1527, and retired to Venice. He was not however entirely a stranger in that city, having visited it shortly before, when he was introduced to the doge, Andrea Gritti, whose patronage was of essential service to him. One of the first works he was employed upon was the repairing the domes of St. Mark's; after which he executed a great number of structures, both for the republic and private individuals, among which are S. Giorgio de' Greci, La Scuola della Misericordia, the Palazzo Cornaro a S. Maurizio (one of his best works), S. Francesco della Vigna, La Zecca or Mint, the Public Library, the Loggia del Campanile, S. Geminiano (now taken down), Palazzo Delfino, Fabbriche Nuove di Rialto, &c. Among these the Zecca is considered one of his finest works, yet it certainly is deficient in character, and the windows are too large and too numerous. Inconsistencies of a different kind occur in the Loggia del Campanile, a highly ornamented piece of architecture, for while the sculptures on the exterior represent heathen deities, the Virgin Mary occupies the niche within. Still this incongruity is excusable in comparison with that exhibited by him in a magnificent bronze door in the sacristy of St. Mark's, the two principal compartments of which represent the Saviour's death and resurrection, while the smaller panels are decorated with the heads of the evangelists, besides those of some of his own friends, including that of Peter Aretin. His professional reputation was at one time in great jeopardy, for scarcely was the vaulted ceiling of the Public Library completed, when it fell down, in consequence of which he was imprisoned and fined, though shortly after liberated and restored to his former office. Notwithstanding his numerous engagements as an architect, he did not give up sculpture entirely, but he executed the two colossal figures of Mars and Neptune, which adorn what is from them called the Giants' Staircase in the ducal palace, when upwards of 75 years of age. He died at the age of 91, November 27th, 1578. According to Vasari, he enjoyed unimpaired health and strength to the last. As a sculptor, he formed many excellent scholars, and among others Danese Cataneo and Alessandro Vittoria. Jacopo had a son, supposed to have been illegitimate, viz.:—

SANSOVINO, FRANCESCO, who was born at Rome in 1521, was educated to the law, took his degree at Padua, and began to practise at the bar in Venice, but with so little success that he resolved to try his fortune some other way at the court of Rome, Cardinal di Monte, his godfather, having been elected pope (Julius III.) in 1550. Yet although he was kindly received by the pontiff and made one of his chamberlains, he was so disappointed in the chimerical expectations he had formed, that he returned to Venice, where he thenceforth applied himself entirely to literature. The number of his productions, among which are several translations from the classics, histories, and historical collections, abridgments, &c., attest his industry; but the works by which he is now chiefly remembered are his 'Description of Venice,' and the 'Cento Novelle scelti de' più nobili Scrittori della Lingua Volgare;' which last has been frequently reprinted, but though the later editions have been augmented by a hundred additional tales, they are less esteemed than those of 1565 and 1566. Francesco died at Venice, 28th September, 1583.

SANTA CRUZ. [Mexican States.]

SANTA CRUZ RIVER. [Patagonia.]

SANTA FE'. [Mexican States; Plata, La.]

SANTA FE' DE BOGOTA'. [Bogota.]

SANTA MARI'A DE BETANCURIA, the capital of the island of Fuerteventura, is situated near 28° 30′ N. lat. and 14° 10′ W. long., towards the southern extremity of the valley of Oliva, which is about 15 miles long and generally from two to three wide, and very fertile. The commercial produce of the island is brought to this town, and hence sent across the island to Cabras, which is the only harbour in the island, and is connected with the town by the only paved road. The anchorage at Cabras is indifferent and the landing-place still worse. It exports barilla, orchilla, corn, honey, and goat-skins. The population of Santa Maria de Betancuria may be between 3000 and 4000.

(Arlett, 'Survey of the Canary Islands and of part of the

Western Coast of Africa,' in the *London Geographical Journal*, vol. vi.)

SA'NTA MA'URA, the antient Leucas, called Leucadia by the modern Greeks, and Santa Maura by the Italians, in honour of a saint of that name, is one of the seven Ionian Islands. It lies west of the coast of Acarnania, between 38° 46′ and 39° 6′ N. lat. It is about 20 miles long, and the breadth varies from 5 to 8 miles. The north-east extremity of the island lies very near the mainland, being separated from it by a narrow and shallow channel which is crossed by a sand-bank, dry in some parts, and having from three to four feet water upon it in others. This is the Leucadian isthmus mentioned by Thucydides (iii. 81; iv. 8). The strong fortress of Santa Maura stands on an island in the middle of the channel, surrounded by lagoons, which can be crossed only by monoxyla, or canoes, made of the hollow trunk of a tree, and drawing no more than one foot of water. An aqueduct nearly a mile and a half long, supported by about 300 arches, which serves also as a footpath across the lagoon, connects the fortress with the town of Amaxichi, which lies southward on the eastern coast of the island, and supplies the fortress with good spring-water. It was built by the Turks under Sultan Bayazid II., and is a remarkable structure.

The surface of the island is covered with calcareous hills from 1000 to 1500 feet high; one summit, called Mount St. Elias, attains the height of 3000 feet. The island has no rivers, but there are several springs of good water.

In the north-east part towards Amaxichi there is a fine plain six miles long and about two miles wide, which produces corn, Indian corn, flax, cotton, pulse, and all kinds of fruit. Oil and some wine are the chief produce of the hills. Some sheep and goats are bred; and mules are used for riding and carrying burdens. Fishing is a great resource of the inhabitants, and a large quantity of salt is collected in the lagoons. The population is about 18,000. [IONIAN ISLANDS.]

Amaxichi, the head town of the island, has 5400 inhabitants, several churches and convents, and is the residence of the authorities, as well as of a Greek bishop. It stands in a fine plain on the sea-coast. The air is considered unhealthy. South of Amaxichi, at the southern entrance of the channel, is the port of Drepano, which is the chief anchoring-place in the island. There are also about 30 villages and hamlets scattered about the country.

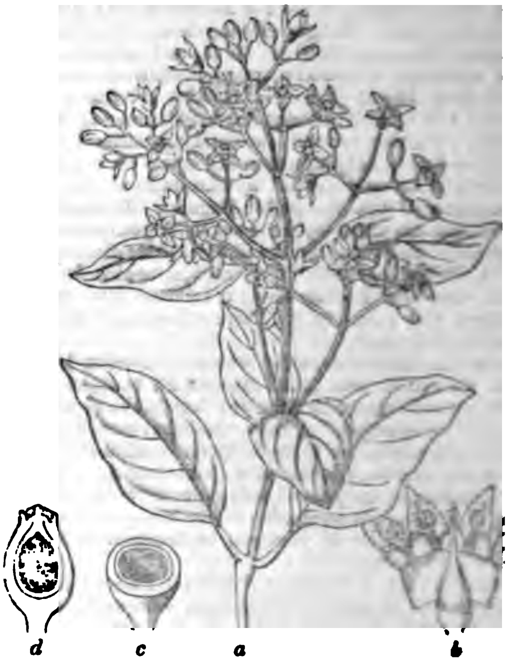
Cape Ducato, the southern extremity of the island facing the island of Cefalonia, which is about five miles distant, is the rock of Leucas spoken of in antient history. [SAPPHO.] There are hardly any vestiges left of the temple of Apollo which once stood here. The antient town of Leucas stood near the site of Amaxichi.

The small island of Meganisi, or Megolonisi, lies along the south-eastern coast of Santa Maura, and belongs to it. It is inhabited, and has olive plantations and pasture for sheep. (Neigebaur, *Ionische Inseln*.)

Leucas was a Corinthian colony. (Thucyd., i. 30.) It is mentioned by Livy (XXX. 17) as forming part of Acarnania, and the town of Leucas as the place of assembly of the Acarnanian council. It was taken by Flamininus in the war against Philip of Macedonia. It afterwards made part of the Roman province of Epirus. After the division of the empire it belonged to the Byzantine emperors till the twelfth century, when the Franks or Latins established a new dynasty at Constantinople, and created several great fiefs in the provinces. Leucas was for a time subject to the counts of Tocco, who bore the name of despots of Achaia, and who raised the fortress of Santa Maura, which gave its name to the island. It afterwards fell into the hands of the Venetians, was taken by the Turks under Sultan Bayazid II. in the latter part of the fifteenth century, and was again restored to the Venetians by the peace of Carlowitz in 1698. After the fall of Venice it was occupied by the French, and attacked unsuccessfully by Ali Pasha of Joannina, and was at last taken from the French by the English at the same time as Cefalonia and the rest of the Ionian Islands.

SANTALA'CEÆ, a natural order of plants belonging to the class of Exogens and subclass Incompletæ. They are trees, shrubs, or herbaceous plants, with round or irregularly-angled branches; alternate or nearly-opposite undivided leaves, sometimes minute, and resembling stipules. The flowers are small, in spikes, racemes, umbels, or solitary. The calyx superior 4- or 5-cleft. Stamens 4 or
the segments of the calyx. Ovary 1-celled, with
4 ovules. Fruit 1-seeded, hard, dry, and drupa-
bumen fleshy. This order is closely allied to
and Thymeleaceæ. One of its most remarkable
is that its unilocular ovary contains always
than one, which are pendulous and attacl
a central receptacle. In the form of we
Santalaceæ are found in Europe and N
New Holland, the East Indies, and the South
they exist as large shrubs or small trees.

The Osyris belongs to this order, although it
having diœcious flowers and a trifid calyx. Tl
ever a different plant from the Osyris of Pliny.
sessed in former times a reputation for curing
The modern genus possesses no sensible pr
medicine, and is principally employed for the
of besoms, for which its long slender branches
The Ogeehee lime, which is used on the Mississip
of olives, is the fruit of *Nyssa candicans*. The
form trees of great beauty, and their wood
compact, and light. The most valuable genus
is its type, the *Santalum*, of which the spec
forms the true sandal-wood of commerce.



Santalum album.

a, Branch with leaves, flowers, and fruit. *b*, Flower with the caly
showing the perigynous stamens and their appendages, the
simple style, and lobed stigma. *c*, Transverse section of fruit, with
d, Longitudinal section of fruit, with solitary pendulous seed.

SANTALIN, the colouring matter of the *Ptero
santalinus*, or red sandal-wood. It was examined by Pel
in 1814, and is readily obtained by digesting the
wood in alcohol, and then diluting the clear solution
water, by which the solution is precipitated of a be
red colour: it is tasteless, nearly insoluble in water
dissolved by alcohol, æther, alkaline solutions, and
by the oils of lavender and rosemary.

The alcoholic solution of santalin gives different
precipitates with metallic solutions; thus with tin
a beautiful purple, with lead a violet, iron a deep b
silver a reddish brown.

Santalin is decomposed by the stronger acids, wit
usual phenomena and products.

According to Pelletier, santalin is composed of

Eight equivalents of hydrogen .	8
Sixteen equivalents of carbon . .	96
Three equivalents of oxygen . .	24
Equivalent . . .	128

Santalin, or rather the red sanders which contains
little used in this country as a dye stuff, but in Ind
is employed both in dyeing silk and cotton; it is us

:o give a colour to certain tinctures, but the colour
·rally regarded as a permanent one.

ALUM, a genus of plants which gives its name to
l order Santalaceæ, to which it belongs. Sandal·
ed by one or more species of Santalum is well
.h in commerce and the arts as a fragrant-smell-
vhence it is used as incense, and employed in the
re of necklaces, fans, elegant boxes, and cabinets.
duct of the Malabar coast of India, as well as of
archipelago, it has been a question whether, like
f the other remarkable products of India, it was
he antients. But it does not appear to have been
t no name or description has been considered to
s substance. It might therefore be inferred that
·wood of the Eastern islands did not then reach
also that the sandal-wood produced on the Ma-
had not been then discovered; but notices of it
arly Sanscrit works. The earliest certain notice
wood is in the works of the Arabs, who describe
he three heads of *sandal abiuz* (white), *sandal*
ow), and *sandal soorkh* (red). Actuarius is the
eek author who mentions Santalum. The above
eferred to in the older European works on Materia
the names of *Santalum album*, *S. citrinum*, and *S.*
he last is the red sandal or sanders-wood of com-
:h is used only as a dye-wood and as a slight astrin-
edicine. This has already been described under
PTEROCARPUS, and the species *P. santalinus*. The
white sandal are both yielded by species of San-
igh there is some difference of opinion on the
'he names are no doubt of Eastern origin, as the
Persian *sundul* are evidently derived from the
e as the Hindee *chundun* and *chundul*, which in
chandana, and in Tamul *shandana*.

us Santalum has hermaphrodite flowers, the
iited at the base with the ovary, the limb superior,
d ventricose, quadrifid, deciduous; glands four,
. inserted into the throat, alternating with the
e limb. Stamens four, inserted into the throat
the lobes of the limb; filaments awl-shaped,
n a pencil of hairs behind; anthers 2-celled.
inferior, 1-celled. Ovules two, antropous pen-
m the apex of a free central placenta. Style
iple. Stigma obscurely 2-3-lobed. Drupe berried,
; margined at the apex. Seed inverse. Embryo
the apex of a fleshy albumen. Radicle above.

a *album*, or the white sandal-wood, is a native
untainous parts of the coast of Malabar, and
ior and the islands of the Indian Archipelago,
able that the same species extends to great dis-
forms a tree of moderate or rather of small size,
branched, and in general appearance has been
ared to the myrtle, and in inflorescence to the
: leaves are opposite, with short petioles, oblong,
oth, glaucous underneath; length from one and
ree inches. The inflorescence is in axillary and
yrsi. Flowers numerous, small, straw-coloured
first expand, but change to a deep ferruginous
:y are inodorous, as are all the exterior parts of
g plant even when bruised. The tree when felled
ie inches or a foot in diameter; it is then barked,
lets, and said to be buried in a dry place for about
months. The deeper the colour and the nearer
e more fragrant it is. As seen in commerce it is
pieces of a white colour and agreeable odour, but
aste. It is usually described as being the young
wood, and that the inner parts, as they become
ne coloured towards the centre, and that this is
of the *yellow*, while the *white* sandal-wood con-
outer and younger wood of the same tree.

he general opinion respecting the origin of yellow
d, but Garcias thought it in his time to be the
a different tree. M. Gaudichaud is of the same
nd has moreover figured the plant in plate 45 of
:al part of the 'Voyage de l'Uranie.' This he
Sandwich Islands, and has named it S. Freyci-
stating it to produce the sandal-wood which is
lued by the Chinese, which they also obtain from
and Marquesa Islands, Moluccas, &c. They
'e various articles with the yellow sandal-wood,
e most fragrant. They also burn it both in their
d private houses as an incense, and especially in
of long slender candles, which are formed by covering the ends of sticks with the sawdust of sandal-wood mixed with rice paste.

S. myrtifolium is another species, or a strongly marked variety of S. album, found by Dr. Roxburgh in the mountains of the Rajamundry Circar, and which was figured by him in plate 2 of his 'Coromandel Plants:' it is distinguished by its opposite lanceolate leaves. The wood is of little value, according to Dr. Roxburgh, but Dr. Wallich says it is 'certe odoratissimum.'

About 200 tons are annually imported into Calcutta from the Malabar coast, and about twice as much into Canton from the islands of the Indian Archipelago.

SANTANDER, a small province of Spain, on the southern coast of the Bay of Biscay, formerly annexed to the province of Burgos. The capital, Santander, is a large seaport town, in 43° 28′ N. lat. and 3° 40′ W. long. It is the centre of considerable trade, especially since the breaking out of the last civil war, which caused most of the wealthy merchants of Bilbao and S. Sebastian to settle in it. Santander is well built, and has a safe and commodious harbour capable of holding men-of-war. The coast has some other excellent harbours. Its commerce with the north of Europe, to which it still exports much wool, is very considerable. It sends likewise flour to the islands of Cuba and Puerto Rico, being one of the *puertos habilitados*, or seaport towns which are allowed to trade with the colonies. The environs of Santander consist of steep mountains and deep valleys, whence the name of 'Montañas de Santander,' which has been given to the particular district in which the capital is situated. The hills are covered with wood, and abound with iron of the best quality, owing to which the government has cannon-founderies and manufactories of cast steel in the neighbourhood, the former at the village of La Cavada, the latter at Lierganes. The population of Santander, which has considerably increased of late years, may now be computed at 30,000.

SANTAREM, a district of Portugal, in the province of Estremadura, extending for nearly thirty miles on both sides of the Tagus, which intersects it from north-east to south-west. The capital, Santarem, is situated on the right bank of that river. The town is well built, and the streets tolerably clean. It is divided into three *barrios*. In former times it was surrounded by thick walls and strong towers, built by the Arabs during their occupation of the Peninsula; but no trace remains at present of the antient fortifications, except the five gates, which serve as entrances to the town, and a ruinous old castle, named 'A Alcasaba,' the residence of the Mohammedan governors. The Roman name of the town is believed to have been 'Scalobis,' and 'Præsidium Julium,' which the Arabs changed into *Shantareyn*, whence Santarem. Alfonso VI. of Castile, the famous conqueror of Toledo, was the first to wrest Santarem from the hands of the Moslems in 1093. It fell again into the hands of the Almoravides, and was retaken by Alfonso Henriques, king of Portugal, in 1147. Yúsuf Abú Yakúb, the second of the Almohades, besieged it 1184 with all his forces; but he was wounded in a sally made by the garrison, and compelled to raise the siege and cross over to Africa, where he died of his wounds, in August, 1184. [MOORS; PORTUGAL.] Near this town the French under Massena remained for some time, being unable to penetrate to Lisbon. There is in Santarem an academy of history, instituted in the year 1747. The population is estimated at 16,000.

SANTEE, River. [CAROLINA, SOUTH.]

SANTERRE. [PICARDIE.]

SANTIA'GO, a province of Spain, and one of the seven into which the antient kingdom of Galicia is now divided. It is also the name of the capital, 'Compostella' (Campus Stellæ), which, from its celebrated temple dedicated to the Apostle St. James, or Santiago, as the Spaniards call him, is more generally known as 'Santiago de Compostella.' This city is situated in a beautiful plain surrounded on all sides by fertile hills, and close to the rivers Sar and Sarella, which unite their waters about two miles below. Two other rivers, the Tambre and the Ulla, irrigate the neighbouring districts, which are exceedingly fertile and productive. Santiago is badly built and worse paved; the streets are narrow and crooked, and with the exception of two or three monastic buildings, and the cathedral, which is in itself a curiosity, there is nothing remarkable in it. The cathedral was built about the end of the ninth century, by Alonso el Magno, king of Asturias and Leon; but it has since been so altered and added to, that scarcely any part of the original building remains. It contains some very fine wood-carvings, and richly-painted windows. In a subterraneous chapel underneath the principal altar, pious Catholics adore what are believed to be the bodies of St. James and two of his disciples, Athanasius and Theodorus, which, according to tradition, were discovered at the time when the cathedral was built. This circumstance made Compostella the resort of innumerable pilgrims from all the Catholic countries in Europe. In 1428 the number who left the shores of England amounted to 916; and in 1433 it was increased to 2480. It was the practice for the crown to grant licences to masters of ships for carrying out a limited number of pilgrims, who generally took with them large sums of money to defray their travelling expenses, and to present offerings to the church. Pilgrims from France, Italy, and all parts of Germany went thither by land across the Pyrenees, and traversed Biscay and Asturias. In order to encourage their visits, the canons of San Eloy, a church outside of Compostella, built several hospitals on the route for the accommodation of the pilgrims, and formed themselves into a brotherhood to protect them against the attacks of the Moslems. This was the origin of the celebrated order of Santiago (Mariana, *Hist. Gen. de Esp.*, lib. xi., cap. xiii.), instituted by Ferdinand II. of Leon, in 1158. It was long believed that from the offerings made by the pilgrims the canons attached to the church had been enabled to amass immense riches. These however had been greatly exaggerated; for, in 1809, when Marshal Ney took possession of the city, and compelled the chapter to exhibit their treasure, and give him half of it for the pay of his troops, it was found to consist only of about 40,000*l*. The gold statue of St. James turned out to be of gilt brass, and his diamond eyes imitation stones. The convent of San Martin, founded by Sisenando, bishop of Compostella, at the beginning of the tenth century, is another building remarkable for its great antiquity and excellent preservation. There is likewise an hospital for the use of the pilgrims, erected by the command and at the expense of Ferdinand and Isabella, about the close of the fifteenth century.

Santiago was one of the first towns wrested from the Arabs by the successors of Pelayo. [MOORS] They maintained themselves in it until A.D. 997, when the celebrated Al-Mansúr took the city, destroyed the temple, and carried away its bells to Cordova, there to be suspended from the ceiling of the mosque, where they remained in the place of chandeliers, until, on the taking of Cordova, Fernando III. caused them to be taken back to Santiago on the shoulders of his Moslem captives. (Al-Makkarí, *Moham. Dynast. in Spain*, Lond., 1840, vol. i., p. 41.)

Santiago is the see of an archbishop, and the seat of a university, founded in 1533, but which is seldom frequented by any students except those who are natives of Galicia. The trade of the place is of little importance, consisting only of a few tan-yards and manufactures of coarse linen-stuffs for the country people. In former times there was a considerable trade in images, chaplets, &c. for the pilgrims, but this has long ago ceased to be a source of profit. The population is computed at 20,000. It is 98 miles from Astorga; in 42° 52′ N. lat., 8° 30′ W. long.

SANTIA'GO, the capital of the republic of Chile, in South America, is situated in 33° 20′ S. lat. and 70° 40′ W. long., in a large plain which extends eighty miles north and south, and about fifty miles east and west. This plain borders, on the east, on the high range of the Andes, which are covered with snow during the greater part of the year, and on the west on a range of hills called the Cuesta de Prado, which divides it from the shores of the Pacific. This plain is about 1850 feet above the level of the sea, and unfit for agricultural purposes, except where it is irrigated along the banks of some small rivers, and a canal which brings water from the river Maypú to the vicinity of the town, and fertilizes a tract more than twenty miles in length and several miles in width.

Santiago is one of the finest cities in America in respect to buildings, convenience, and healthiness. It stands on a very gentle slope towards the west; and it is regularly laid out, being divided, like other Spanish towns, into rectangular and equal squares, called quadras. The principal streets, which are about forty-five feet wide, eight in number, run south-east and north-west, and are crossed by twelve other streets, all of equal width. The streets are paved with small rounded stones taken from the bed of the river Mapocho, and have a gutter in the middle, through which a current of water, flowing from the river, [illegible] to two hours in the day, by which [illegible] clean. Most of the streets are paved on one [illegible] of red porphyry quarried from the neighbou[illegible] Christoval; the width of this pavement is [illegible] houses are usually only one story high, on [illegible] earthquakes, but they are very large, and contai[illegible] arranged round three quadra[illegible] The entrance of the house is [illegible] archway, which leads to the front p[illegible], wh[illegible] separated from the second by a [illegible] The second patio is laid out wit[illegible] used for domestic purposes. The windows [illegible] looking into the front patio, and especially the [illegible]dows of the sala, are protected by h[illegible] wrought gratings, which are sometimes [illegible] in the other patios have no windows. [illegible] houses along the street is occupied by [illegible] have no communication with the interio[illegible] serve as shops for mechanics and retailers. [illegible] houses are four feet thick, and built of large [illegible] of baked mud, but they are all whitewashed [illegible] which gives them an agreeable appearance. [illegible] with red tiles.

The Plaza, or great square, stands nearly in [illegible] the city; it occupies the space of a whole [illegible] a handsome bronze fountain in the centre, [illegible] basin of hewn stone, from which the inha[illegible] plied with water by water-carriers. The bu[illegible] north-west side are, the government palace, [illegible] the chamber of justice. On the south-west [illegible] cathedral and the palace of the bishop; on the [illegible] side are a number of little shops, and [illegible] there are private residences. The palace [illegible] building, in the Moorish style, of which it is a [illegible] men. The cathedral is the only stone building i[illegible] though somewhat heavy, it is ornamented, but no[illegible] The other public buildings of the town are in a good [illegible] but they are not large, except the Casa de [illegible] This building occupies a whole quadra, or [illegible] every way, is two stories high, has three c[illegible] a great number of apartments for those [illegible] officers of the establishment. But no [illegible] coined there for some years, and the m[illegible] removed to Coquimbo. There are several [illegible] and convents in Santiago, especially those [illegible] San Francisco, and San Augustin.

At the eastern extremity of the town is a [illegible] rock[illegible] eminence, on which the fort of Santa Lucia is [illegible] is much visited by foreigners on account [illegible] view which it affords of the Andes. Adjac[illegible] the north is the Tajamar, or breakwater. The ri[illegible] skirts the northern side of the town, and tho[illegible] season a small river, it swells in the rainy sea[illegible] and the melting of the snow in the mountains to such a [illegible]dable size that it would inundate the to[illegible] if it [illegible] kept off by the Tajamar. This breakwate[illegible] brick and mortar masonry, about six feet [illegible] widening towards the ground, with a p[illegible] brick in thickness, and three feet high: it [illegible] the whole of its extent, which is two miles, [illegible] pebbles. It was formerly used as a public walk. [illegible] western extremity of the Tajamar is a handsome [illegible] over the Mapocho, of eight arches, which le[illegible] suburb of Chimba. Along the south-western [illegible] city is the Cañada, which is a large open [illegible] four magnificent rows of poplars, whic[illegible] small canals constantly full of clear runn[illegible] is at present the public walk. The Cañ[illegible] city from the large suburb called La [illegible] western extremity of the city is the [illegible] Chuchunco.

As no census has been taken, the popul[illegible]on of S[illegible] is not exactly known. Thirty years ago it [illegible] 40,000, but modern travellers have made it [illegible] habitants are nearly all of pure European blood; [illegible] have a slight mixture of Indian blood. The town [illegible] flourishing condition to the circumstance of havi[illegible] many years the seat of government and the [illegible] great landed proprietors. The state of so[illegible] improved since the country acquired its [illegible] many schools have been established, and [illegible] several schools for females, whose education is [illegible] neglected in the other countries of South America. s also a college.

arse ponchos and saddlery are made to some extent, sent to the other parts of Chile. Santiago exports roduce of its mines, and jerked beef, hides, and fruits alparaiso, from which place it receives the manufac- of Europe, China, and the East Indies, with sugar, , and some other colonial productions from Peru and ral America. A good road leads from Santiago to araiso, a distance of ninety miles; it is the best arti- road in South America, and practicable for carriages, it crosses three ranges of steep hills. Santiago has ommercial intercourse with Mendoza on the eastern of the Andes. Two roads connect these towns. The ern traverses the Andes by the mountain-pass of llata, which, at its highest elevation, called the Cumbre, is 12,454 feet above the sea-level, and may be passed ules from the beginning of November to the end of The southern road leads over the mountain-pass of llo, south of Mount Tupungato, which attains an ele- of 14,365 feet above the sea-level, and is seldom open r than from the beginning of January to the end of . By these roads Santiago receives mules, hides, soap, r, dried fruits, and wine from Mendoza.

Iiers's *Travels in Chile and La Plata*; Haigh's *hes of Buenos Ayres, Chile, and Peru*; *Campaigns Cruises in Venezuela and New Granada, and in the Ocean*; Parish's *Buenos Ayres and the Provinces Plata*; and *Surveying Voyages of the Adventure and le.*)

NTIAGO DEL ESTERO. [Plata, La.]

NTONIN, a vegetable principle possessing acid pro- obtained from the seeds of the *Artemisia santonica*, uthernwood. Its properties are, that it is colourless, allizes in six-sided prisms and some other forms, is ute of smell, and when long chewed is slightly . It is soluble in 4000 to 5000 times its weight of water, and 250 times when boiling. It is soluble in ol, and in the fixed and volatile oils. When strongly d, it is decomposed. The alcoholic solution reddens s-paper, and with some bases it forms neutral and allizable salts; this is the case with santonate of soda antonate of lime; some of the metallic santonates are le and others insoluble in water. None of them is ed to any use.

ebig supposes it to be composed of

Thirty-six equivalents of hydrogen .	360
Sixty equivalents of carbon . .	360
Twelve equivalents of oxygen . .	96
Equivalent . . .	816

NTORIN. [Thera.]

NTOS. [Brazil, p. 365.]

NZ, AUGUSTIN, a Spanish architect, was born at ssa, December 29, 1724. He studied the practical his profession under Raymundo Cortès, surveyor- ral of the public buildings in that city, and the theo- al one in the school of design established there by the ptor Ramirez at his own expense. But for the progress fterwards made, and the taste he displayed, he was tly indebted to the instruction and advice of Ventura riguez [Rodriguez], when the latter was engaged at ssa on the chapel *del Pilar*. In 1775 he was elected ber of the Academy of St. Ferdinand, and when the l instituted by Goicoechea was made an academy by title of that of San Luis, in 1792, Sanz was appointed ctor, having previously given instruction in architec- there without any emolument. In his capacity of lic teacher he did much towards eradicating the pre- ces and corrupt taste of the preceding period, when the was in a very degraded state in Spain: and towards oducing a better style. Nor was his influence incon- rable, as the government appointed him to inspect all for public buildings proposed to be erected in . Among those erected by himself the principal church of Santa Cruz, Saragossa (of the Corinthian er, and forming a Greek cross in its plan), and those at ea and Binaces, both of them built at the expense of Duke de Hijar. He also designed the theatre and other public edifices at Saragossa, besides a number of te houses. He died July 25, 1801, and left a son, as Sanz, who was also an architect, and who completed the façade of the church at Epila, which building had been begun by his father.

SAÔNE, River. [France.]

SAÔNE ET LOIRE, a department of France, bounded on the north by the department of Côte d'Or, on the east by that of Jura, on the south-east by that of Ain, on the south by that of Rhône, on the south-west by that of Loire, on the west by that of Allier, and on the north-west by that of Nièvre. Its form is tolerably compact, but irregular; the greatest length from north to south is from the neighbourhood of Lucenay l'Evêque to the neighbourhood of Châteauneuf 68 miles; the greatest breadth from east to west is from between Lons-le-Saulnier (Jura) and Louhans to the banks of the Loire near Crona or Cronat, 85 miles. The area is estimated at 3316 square miles, being rather greater than the aggregate area of the English counties of Chester, Stafford, and Derby. The population in 1831 was 523,970; in 1836 it was 538,507; showing an increase in five years of 14,537, or 2·8 per cent, and giving 162 inhabitants to a square mile. In amount of population it is very far above the average of the French departments, but very far below the English counties with which we have compared it. In density of population it is just below the average of the departments, and far below the English counties. Mâcon, the chief town, is 208 miles in a direct line south-east of Paris, or 244 miles by the road through Melun, Sens, Auxerre, Autun, and Châlons-sur Saône.

The department is traversed from south to north through its centre by the Charolais and Mâconnais heights, which form the prolongation northward of the Cévennes, and unite them with the Côte d'Or, the heights of Langres, the Faucilles, and the Vosges. These heights in the southern part consist of short parallel ranges of hills separated by longitudinal valleys drained by the feeders of the Saône or the Loire. In the northern part of the department they do not occupy so much space as in the southern, and consist of two ranges of low hills separated by the valley of the Dheune, through which the Canal du Centre passes. On the eastern and western sides of these heights the surface of the department is tolerably level. The principal summits are Mont St. Vincent, in the centre of the department, estimated at about 1915 feet; Monts Suin, Crozan, Dun, and La Mère-Boitier in the south; the latter, which is near Mâcon, has an elevation of 3177 feet.

The Charolais heights consist of granitic or of the lower stratified rocks, and these formations overspread the more level country on the west side of the chain. The eastern slopes of these heights, and the plain at their base nearly to the Saône, are occupied by the formations which intervene between the cretaceous group and the new red-sandstone group. A considerable extent of country around Charolles, on the west side of the heights, extending northward almost to the Arroux, is occupied by the same formations. The immediate banks of the Loire (above the junction of the Arroux and of the Saône, and that portion of the department which lies east of the Saône, are occupied by the supracretaceous formations.

In minerals this is one of the richest departments in France. In productiveness of coal it is exceeded only by the departments of Loire and Nord. It contains two distinct coal-fields, which had, in 1834, ten mines at work and seven not at work, giving employment to 1390 men in the pits and 409 others, and producing 150,456 tons of coal. In 1835 the larger coal-field, Le Bassin du Creusot et de Blanzy, had eight mines at work out of thirteen: the smaller coal-field had three mines at work: the total produce was 142,149 tons. At Creusot, where the pits are deepest, the workings are 650 feet below the surface. The produce of these coal-fields is adapted for nearly all manufacturing purposes, and is distributed by means of a railroad seventeen miles long, which conveys the coal to the Canal du Centre There were, in 1834, in the department, eleven iron-works, in which were eleven furnaces, seven employing charcoal and four coke, for the manufacture of pig-iron; and forty-five forges for the manufacture of wrought iron. The richest manganese-mine in France is at Romanèche, near the Saône, in the southern part of the department· it yielded, in 1835, 900 tons of manganese, being more than half the whole produce of France. Marble, alabaster, lithographic stones, and abundance of freestone are quarried.

The department is partly in the basin of the Loire, partly in that of the Saône, or, more properly, of the Rhône, to which the Saône is tributary. The line of separation between the two basins is formed by the Charolais heights, the country on the east of them being drained by the Saône, and the country on the west by the Loire. The Saône itself enters the department on the north-east side, between Seurre (Côte d'Or) and Verdun-sur-Saône: it pursues a winding course south-south-west past Verdun and Châlons-sur-Saône, from which town its course is more directly south, to the junction of the Reyssouce, near Pont-de-Vaux (Ain), where it reaches the boundary of the department, and has its course along it to the neighbourhood of Thoissey (Ain), where it quits the department altogether. Its length within or upon the border may be estimated at 72 miles, navigable throughout. Its principal affluents are the Doubs (of which about 17 miles are within or upon the boundary of the department), and the Seille (of whose course about 41 miles, 27 of them, viz. from Louhans, navigable, belong to this department), on the left bank; and the Dheune (38 miles long), the Gaye (40 miles long), and the Grône (50 miles long), on the right or east bank. The Doubs receives the Guiotte on its left bank, and the Seille receives the Solman and the Sane on its left bank.

The Loire enters the department on the south-west side, crosses the south-west corner, and for the remainder of its course, until it quits the department altogether, forms the western boundary; about 53 miles of its course, all navigable, belong to this department, but the navigation is so inconvenient, that a lateral canal through this part of its course is in execution. It receives the Arconce, or Reconce (40 miles long); the Arroux (65 miles long), which has 12 miles of navigation, and receives the Creusevaux (25 miles long), the Bourbince (42 miles long), and other streams; the Somme and the Tannay, all on its right or east bank. There are a number of small lakes, some of them, as those of Montchanain and Long Pendu, amid the Charolais heights, on the limit of the two river-basins.

The canals are as follows:—the Canal du Centre (formerly called Canal du Charolais) unites the Loire and the Saône: it was commenced A.D. 1783, and finished A.D. 1792. It commences in the Loire at Digoin, and follows the valley of the Arroux for a very short distance, then that of the Bourbince, at the head of which valley is its summit-level, about two miles long, where the canal crosses a depression in the Charolais heights: it then descends by the valley of the Dheune to the neighbourhood of Chagny, where it turns off, and joins the Saône at Châlons. Its length may be estimated at 75 miles, all in this department. The lateral canal to the Loire consists of two parts, one extending from Roanne, in the department of Loire, to Digoin, in this department: the other from Digoin to Briare, in the department of Loiret. We are not informed what progress has been made in the formation of these canals; the last-mentioned part, the earliest in point of time, was commenced by virtue of a law passed in 1822.

The official statement of the navigation of the department is as follows:—

Rivers.—Saône	73 miles		
Doubs	9		
Seille	25		
Loire	57		
Arroux	12		
		— 176	
Canals.—Canal du Centre	73		
Canal latéral à la Loire, from Roanne to Digoin	11		
Canal latéral à la Loire, from Digoin to Briare	3		
		— 87	
			263

The number of Routes Royales, or government roads, is seven, having an aggregate length (Jan. 1, 1837) of 343 miles, viz. 256 miles in good repair, 48 miles out of repair, and 39 miles unfinished. The principal road is that from Paris to Lyon by Sens and Auxerre, which enters the department on the north-west side, and runs to Lucenay L'Evêque and Autun, from whence it proceeds south-east across the Charolais heights, by Couches and Bourgneuf, to Châlons sur-Saône: here it turns south, and follows the valley of the Saône, by Grand Senecey, Tournus, and Mâcon, into the adjacent department of Rhône. This road formerly followed another line from Saulieu (department of Côte d'Or) to Châlons, avoiding Autun, entering the department at Chagny on the northern boundary, [illegible] thence to Châlons; but this line, though [illegible] two, has been abandoned, in order to take in Au[illegible] second road from Paris to Lyon by Dijon ent[illegible] ment at Chagny, and runs to Châlons. A [illegible] unite at Autun; one from Nevers and Cl[illegible] the department of Nièvre; another [illegible] department of Allier; a third from [illegible] the department of Côte d'Or; and [illegible] Roads run, one from Châlons across to [illegible] and from thence to Lons-le-Sa[illegible] Jura; another from Tournus [illegible] Seille, by Cuisery and Romenay, to [illegible] department of Ain; and two others [illegible] rolles, Paray, Digoin, Bourbon, Lancy [illegible] to Nevers; and the second acr[illegible] Routes Départementales, or de[illegible] roads, same date, an aggregate le[illegible] miles [illegible] repair, 68 out of repair, and [illegible] unfinished. [illegible] had an aggregate length of nearly [illegible] few departments so well provided [illegible] munication both by land and water.

The climate is changeable in the [illegible] where intermittent fevers are common: it [illegible] part to allow the culture of the vine. In the [illegible] tending from these heights to the Saône, [illegible] lightful. The area of the department may [illegible] round numbers at 2,140,000 acres, of which [illegible] or more than half, are under the plough. [illegible] corn and potatoes, taken together, is abou[illegible] consumption of the people, with the excep[illegible] which the produce is far below the d[illegible] maslin (wheat and rye sown togeth[illegible] maize, the produce is above the av[illegible] buckwheat, and in potatoes, though [illegible] staple food of the inhabitants of the heig[illegible] below the average. That part of the dep[illegible] on the east of the Saône is chiefly a co[illegible] grow[illegible] the parts immediately adjacent to the river are [illegible] wine and pasturage, as well as in corn; and the [illegible] tween the heights and the Loire abounds in p[illegible] meadows and grass-lands have an extent of [illegible] nearly, beside 64,000 to 65,000 acres of heath or [illegible] pasture-ground. The number of horses [illegible] small: that of horned cattle, especially ox[illegible] average. The beef of the district is v[illegible] the [illegible] pal supply of Lyon is from this depart[illegible] of sheep is very small indeed, scarcely [illegible] computed relatively to the population, to [illegible] of the average of France. A considerable [illegible] are bred. Oxen are very generally employed in [illegible] of agriculture, and a considerable number are sen[illegible] neighbourhood of Charolles for the supply of the [illegible] Paris. The vineyards occupy about 95,000 acres [illegible] of the wines are in high repute: those of Les T[illegible] Chenas are among the red wines of the first [illegible] of Fleury, La Chapelle-Guinchey, and La [illegible] the second class: the white wines of P[illegible] are first-class wines; and those of Che[illegible] Davayé are of the second class. These are [illegible] the neighbourhood of Mâcon. The great [illegible] ranks however only as common table-wine: [illegible] Mâconnais, or the district of Mâcon, which [illegible] is the best of its class. That of Charol[illegible] or Charolles, which is chiefly sent to Lyon, is, [illegible] hand, among the worst, and has nothing to rec[illegible] its low price.

The woodlands occupy nearly 400,000 acres: th[illegible] is chiefly oak, beech, ash, pine, fir, and chesnut. [illegible] and the wild boar are found in those woods which [illegible] the Charolais heights.

The department is divided into five [illegible] follows:—

Name and Situation.		Area in Sq. Miles.	Cantons.	Communes.	Population. [illegible]	[illegible]
Mâcon	S.E.	477	9	133	114,061	11[illegible]
Autun	N.W.	727	8	85	85,485	8[illegible]
Charolles	S.W.	963	13	138	120,551	12[illegible]
Châlons-sur-Saône	N.E.	668	10	155	120,461	124[illegible]
Louhans	E.	481	8	81	83,412	[illegible]
		3316	48	592	523,970	[illegible]

e arrondissement of Mâcon contains the following
:—Mâcon, pop. in 1831, 10,998; in 1836, 11,944
on]; and Tournus, pop. 4316 town, 5311 whole com-
, on the Saône; Lugny, on a small feeder flowing from
harolais heights into the Saône; Matour and Cluny,
368 town, 4152 whole commune [Cluny], on or near
rône; St. Gengou, between the Grone and the Gaye;
Romenay, east of the Saône, between the Seille and
ane Vive, one of the affluents of the Sane. Tournus
asantly situated at the foot of a little hill on the bank
e Saône, over which there is a good wooden bridge:
iouses are indifferently built; there are two public
, and a quay along the river. The townsmen manu-
e hats, blankets, cotton counterpanes, beet-root sugar,
otash: they send a great quantity of good building-
to Lyon by the river, and carry on trade in corn and
There are twelve yearly fairs. There is a tribunal of
ierce. Greuze, the painter, was born at Tournus.
ar is pleasantly situated in a grazing country: it has
e yearly fairs. St. Gengou, or St. Gengoux, is in a
t producing some of the best wine in this part of
e, in which the townsmen carry on a considerable
; they manufacture hats and leather, and have six
fairs in the year.

he arrondisement of Autun are—Autun, population in
8610 town, 9921 whole commune; in 1836, 10,435 com-
[Autun], on the Arroux; Lucenay-l'Evêque, on the
evaux, a feeder of the Arroux; Issy-l'Evêque, on the
; and Montcenis, and Couches, between the Arroux
ie Dheune. Montcenis is on a hill in the coal-mining
t, and at the foot of the hill, near the town, is the village
uzot or Creusot, population 3117, celebrated for its glass-
, which are among the most important in France for
ind cutting flint glass, and for its foundry of cannon
navy, with the connected iron-works for the manu-
e of heavy iron goods. From 1500 to 2000 workmen
loyed in the coal and iron mines, iron-works, glass-
&c., of these places and the surrounding villages.

he arrondissement of Charolles are—Charolles, popula-
1831, 2781 town, 2984 whole commune; in 1836,
ommune, on the Reconce; Le Bois-Sainte-Marie, on
l feeder of the Reconce; Paray-le-Monial, population
own, 3400 whole commune, on the Bourbince; Per-
n the Oudrache a feeder of the Bourbince; Toulon and
ion, on the Arroux; Crona or Cronat, Bourbon-Lancy
n-Lancy], La Motte-St.-Jean, Digoin, population
own, 2900 whole commune; Marcigny, population
own, 2620 whole commune; and Semur, all on or
he Loire; and La Clayette and Châteauneuf on or
he Sornin. Charolles has one or two fiscal offices, a
inate court of justice, a tribunal of commerce, an
ltural society, and a high school. The townsmen are
ed in iron-works, which supply wrought iron to the
of St. Etienne in the department of Loire, and in pot-
They carry on trade in the wine, wood, and fat cattle
surrounding country, which are sent to Paris. Paray-
nial is a tolerably well built town, in a fertile valley;
an hospital and a high-school. The townsmen trade
and have nine yearly fairs. Perrecy and Gueugnon
ron-works. Digoin, at the junction of the Canal du
with the Loire, carries on a considerable trade, espe-
n salt. There is a manufactory of earthenware. Six
or cattle are held in the year. The inhabitants of
gny manufacture leather and table linen, and carry on
in corn and wine; they have five fairs in the year.
is distinguished as Semur-en-Brionnais, from another
ore important town, Semur-en-Auxois, in the adjacent
ment of Côte d'Or. The townsmen trade in corn, wine,
ttle. Cotton goods and leather are manufactured at
te. At Chauffailes, near Châteauneuf, is a considerable
factory.

ie arrondissement of Châlons are—Châlons-sur-Saône,
ation in 1831, 12,220; in 1836, 12,400 [Chalons-sur-
]; and Verdun sur Saône, population 1796, on the
; Chagny, population 2989, on the Dheune; Givry,
ation 2882, and Bourgneuf, between the Gaye and the
ie; Mont St. Vincent, between the Gaye and the
ince; Buxy, population 1954, between the Gaye and the
; and Grand Senecey, or Senecey le Grand, popu-
2406, between the Grône and Saône. Verdun-sur-
is immediately below the junction of the Doubs with
aône, on the left or east bank of the latter. It was a
ed town in the middle ages, and was often taken and
retaken. The towsmen manufacture pottery and earthenware, and carry on trade in corn, wine, and fruit. They have three yearly fairs. Chagny is rather a pretty town in the midst of a country of vineyards, but the wines are not of the best quality. The townsmen carry on considerable trade, and have five yearly fairs. Bourgneuf consists principally of one wide street, of which one side is in the commune of Bourgneuf, the other in that of Touches. It is a pretty town of 1200 inhabitants. The country round Givry produces excellent wines. Mont St. Vincent is sometimes called Belvéder (Belvidere), from the fine prospect which, from its situation on a lofty eminence, it commands. The chief trade is in wool. There are six yearly fairs. Senecey le Grand is a handsome well-built town, though small The townsmen carry on trade in corn and wine. They have six yearly fairs.

In the arrondissement of Louhans are—Louhans, population in 1831, 3411; in 1836, 3674; and Cuisery, population 1732, on the Seille; Sainte Croix, on the Solman; Cuiseau or Cuiseaux, population 1753, on a branch of the Solman; Montpont, on the Sane Vive, one of the streams which unite to form the Sane; Bellevesvre, on a feeder of the Seille; and Mervans, on the Guiotte. Louhans is an old town, with the upper stories of the houses projecting over the causeway. It has an hospital, an agricultural society, and a high school, besides some judicial and fiscal government offices. It stands on the left bank of the river Seille, the navigation of which commences here. The town is a mart for the manufactures of Lyon and Switzerland, and there are some iron-works. There are nine yearly fairs. The townsmen of Cuiseaux or Cuiseau (sometimes written Cuzeau), the country of the historian Paradin, carry on trade in corn, wine, and poultry. There are nine yearly fairs.

The population of the towns given above, is, where not otherwise mentioned, that of the whole commune, and from the census of 1831.

The department constitutes the diocese of Autun, in the ecclesiastical province of Lyon and Vienne. It is in the jurisdiction of the Cour Royale of Dijon, and of the Académie Universitaire of that city. It is in the eighteenth military division, the head quarters of which are at Dijon. It sends seven members to the Chamber of Deputies.

In respect of education this department is behind the average of the French departments. Of the young men enrolled in the military census of 1828-29, only 32 in every 100 could read and write, the average of the departments being a little under 40 in the 100.

In the earliest historic period this part of France was chiefly comprehended in the territories of the Aedui and the Sequani, two Celtic nations, separated from each other by the Arar or Saône, the Sequani being on the east and the Aedui on the west of that river. The south-western part, known in the middle ages as the district of Brionnais, appears to have been the seat of the Aulerci Brannovices or Brannovii, a people dependent on the Aedui, mentioned in the present copies of Cæsar as two nations, but whom D'Anville is inclined to consider as only one. The Aedui were, under the Romans, comprehended in the province of Lugdunensis Prima, the Sequani in Maxima Sequanorum, a subdivision of the province of Belgica.

Several Gallic or Roman towns were within the limits of this department. Bibracte, which Cæsar describes as the principal town of the Aedui (*De Bell. Gall.*, i. 23; vii. 55), and to which the Romans gave the name of Augustodunum (Αὐγουστόδυνος or Αὐγουστόδυνον, Ptol.), may be identified with the modern Autun, a place remarkable for its antiquities. [Autun.] Cabilonum, mentioned by Cæsar (*De Bell. Gall.*, vii. 90) and by several subsequent writers, and Matisco, also mentioned by Cæsar (*De Bell. Gall.*, vii. 90), are the modern Châlons and Mâcon. The modern names of these three towns are obviously derived by corruption from the antient ones. The Boxum and Teionnum, or, by a probable correction of D'Anville, Telonnum of the Peutinger Table, may be recognised in the village of Bussière, and in the little town of Toulon on the Arroux; and the Aquae Nisineii and Pocrinium of the same authority, in the town of Bourbon Lancy and the village of Porigny or Perigny on the Loire. The Pons Dubis of the Peutinger Table was probably on the Doubs just within the limits of this department. Tinurtium, mentioned in the Antonine Itinerary and the Peutinger Table, is identified by D'Anville with Tournus. The place 'duodecimum apud lapidem' (*i.e.* the twelfth milestone from Augustodunum), where the Aeduan rebellion under

Sacrovir was put down by Silius (Tacit., *Annalium*, lib. iii., cap. 45, 46), must have been near Couches, between Autun and Châlons. The subsequent changes of this part of France are noticed elsewhere. [BOURGOGNE.]

SAÔNE, HAUTE, a department in the eastern part of France, bounded on the north by the department of Vosges, on the east by that of Haut Rhin, on the south by that of Doubs, on the south-west by that of Jura, on the west by that of Côte d'Or, and on the north-west by that of Haute Marne. Its form is tolerably compact, approximating to an oval. The greatest length is from east-north-east to west-south-west, from the junction of the three departments of Vosges, Haute Saône, and Haut Rhin, to the border near Gray, 72 miles; the greatest breadth, at right angles to the length, is from the neighbourhood of Jonvelle, on the Saône, to the bank of the Oignon near Rougemont in the department of Doubs, 38 miles. The area of the department is estimated at 2056 square miles. The population in 1831 was 338,910; in 1836, 343,298; showing an increase in five years of 4388, or rather more than 1 per cent., and giving 167 inhabitants to a square mile. In area and amount of population it is below the average of the French departments; but in density of population is just about the average. In area it may be compared with the English county of Norfolk; but falls short of it both in amount and density of population. Vesoul, the chief town, is on the Drejon, a feeder of the Saône, 193 miles in a direct line south-east of Paris, or 210 miles by the road through Provins, Troyes, Chaumont, and Langres.

The eastern side of the department is occupied by the branches of the Vosges, the main ridge of which is just upon the border. The principal elevations are Le Ballon de Servance, 3967 feet; and Le Ballon de Lure, 3718 feet. A range of heights branching from the Vosges skirts the right bank of the Oignon, as far as the road between Vesoul and Besançon, and indeed rather farther; and some of the branches of the Faucilles overspread the northern portion of the department, near the banks of the Saône and the Semousse.

The eastern extremity of the department is occupied by the primary rocks which form the nucleus of the Vosges. The country on the west and south of this primary district is occupied by the sandstone of the Vosges and other of the lower secondary formations, but the greater part of the department is occupied by the secondary formations which intervene between the cretaceous group and the sandstone of the Vosges. The minerals are granite (red and grey), porphyry (purple and green), freestone, stone for lithography, and excellent grindstones, gypsum, and a white sand valuable for the manufacture of glass. There were in 1834 four coal-pits in work, giving employment to between 400 and 500 miners and others, and yielding that year 36,303 tons of coal. In 1835 the produce was only 16,128 tons. Peat is also procured. Iron ore is abundant: there were, in 1834, 45 establishments for the manufacture of pig and wrought iron and steel, comprehending 37 furnaces for the making of pig-iron, 53 forges for the production of wrought-iron, and 5 forges for steel. Charcoal was the fuel almost exclusively employed.

There are several mineral-springs, of which those of Luxeuil, a town at the foot of the Vosges, on the river Breuchin, are the most frequented.

The department belongs to the basin of the Saône, a subdivision of the more extensive basin of the Rhône. The Saône enters the department on the north side, at about 25 or 30 miles from its source, between Châtillon-sur-Saône and Jonvelle: it flows southward, though with some considerable bends, to the junction of the Drejon; after which it turns to the south-west, and flows in a very winding channel past Seveux and Gray, into the department of Côte d'Or. That part of its course which belongs to this department may be estimated at about 80 miles; the navigation, which, according to Brué's Map of France, commences at Seveux above Gray, may be estimated at nearly 30 miles; but the official statements give the navigation at only 15 miles. The principal tributaries which it receives are the Coney, the Superbe, the Lantenne or Lanterne, the Drejon, the Romain, the Morte, and the Oignon, on the left bank; and the Amance, the Gourgeon, and the Saulon on the right bank. Of these the Oignon is the most important: it rises near the eastern extremity of the department amid the Vosges, and flows south-west, partly within, partly upon the border, 90 miles into the Saône. There are no canals.

There are five government roads, having an aggregate length (on 1st Jan., 1837) of 180 miles; viz. 145 miles in good repair, 29 out of repair, and 6 unfinished. The principal road is that from Paris to Vesoul, Béfort, and Bâle or Basel in Switzerland, which enters the department beyond Fay-le-Billot (Haute Marne), and runs through Port-sur-Saône to Vesoul; and from thence by Lure to Béfort. Roads branching from this, one at Langres (Haute Marne), and the other between Fay-le-Billot and Port-sur-Saône, run to Gray, from which town there are roads to Dijon and Besançon, in the adjacent departments of Côte d'Or and Doubs. Roads run from Vesoul to Besançon, and to Epinal in the department of Vosges. The departmental roads have an aggregate length of 252 miles, all in good repair: the bye-roads have an extent of above 2000 miles.

The climate of the department is milder [illegible] neighbouring departments; the heat of [illegible] cold of winter are less intense, and the [illegible] fine; but the spring is variable owi[illegible] perature produced by the melting [illegible] bouring mountains. The soil is on t[illegible] area may be estimated at 1,300,000 acres [illegible] of which about 640,000 acres, or almost one h[illegible] the plough. The quantity of wheat raised [illegible] average produce of the departments, in rye and [illegible] and rye mixed), in maize, barley, and oats con[illegible] the average, especially in oats. Fr[illegible] the ext[illegible] which the potato is cultivat[illegible] inhabitants [illegible] to spare their corn, of which a c[illegible]lerable qua[illegible] to the departments of the south. [illegible] let. beet-[illegible] and seeds for oil are also grown. [illegible] area of nearly 150,000 acres: they are [illegible] banks of the Saône and Oignon, and [illegible] good pasture. The heaths and o[illegible] nearly 55,000 acres. The number o[illegible] cially oxen, is above the average; but [illegible] and still more of sheep, is below the [illegible] horses are in good repute. Pigs, goats, [illegible] but the mule is rare. The vineyards occupy [illegible] acres, and the produce is about eq[illegible] to [illegible] of the departments, but the wine is of very [illegible] The woods occupy nearly 400,000 acres, abun[illegible] dance of oak, beach, and hornbeam; [illegible] the Vosges there is abundance of fir tim[illegible] ash, the maple, and the aspen are not c[illegible] the fox, the squirrel, and the otter are [illegible] tolerably plentiful, especially the hare, the [illegible] ridge, the rail, the woodcock, the snipe, [illegible] quail, the thrush, and the ortolan. The [illegible] fish, including trout, carp, pike, barbel, eels, [illegible]

The department is divided into three arr[illegible] follows:—

	Situation.	Area in Sq. M.	Population. 1831.	Population. [illegible]	Communes. 1837.	Cantons. [illegible]
Vesoul	Central	740	113,200	114,018	252	10
Lure	N.E.	701	137,473	139,381	211	10
Gray	S.W.	615	88,237	89,899	188	7
		2056	338,910	343,298	651	27

The number of cantons or districts, ea[illegible] of the peace, has, since the above Return, [illegible] twenty-eight.

In the arrondissement of Vesoul are—V[illegible] in 1831, 5482 town, or 5583 whole commu[illegible], for the commune, on the Drejon; Jonvelle, P[illegible] population 1965 town, or 2067 whole c[illegible] on the Saône; Jussey, population 2705, [illegible] Amance, on the Superbe; Faverney, [illegible] Montbozon, on the Oignon; and Noroy [illegible] the heights which skirt the valley of the [illegible]

Vesoul is not mentioned in history befo[illegible] tury. In the middle ages it was a place of [illegible] About the middle of the sixteenth century, a[illegible] German town, it was assailed by a [illegible] turning from an expedition into Bre[illegible] it; a sudden inundation however [illegible] and saved the place. In 1644 it [illegible] who violated the terms of capitulat[illegible] pillage. Upon the union of La F[illegible] the prosperity of the town incre[illegible] buildings were constructed. It is well built, [illegible] with handsome public walks. There are a [illegible] andsome high altar in marble, a town-hall, a court-house, covered market, and handsome cavalry barracks, all rected about the middle of the last century; there are also theatre, an hospital, and public vapour-baths. The towns- manufacture calicos and other cottons, braid, hats, wrought-iron roofs, and clock and watch works. here are dye-houses, tan-yards, and bleach-houses for wax. rade is carried on in corn, hay, wine, cattle, iron, and ides: there are twelve yearly fairs. There are a high hool with a cabinet of natural philosophy and natural istory, a public library of 21,000 volumes, an agricultural ociety, by which interesting papers on agriculture are peridically published, a society of the sciences and commerce, nd a departmental nursery-ground.

Jonvelle has four fairs in the year for cattle, horses, coarse oollens and straw hats, of which last two articles a considerble quantity is made in the neighbourhood and sold at these . Port-sur-Saône occupies the site of Portus Abucini, ce mentioned in the 'Notitia Provinciarum Galliæ:' umerous fragments of Roman tiles, the remains of an queduct, tessellated pavements, and medals have been dug p. The place suffered much in the wars of the fifteenth nd sixteenth centuries; it has the ruins of a strong castle an island of the Saône. The townsmen manufacture andles, iron, and wool-combers' cards; form boats or rafts f timber for ship-building or other purposes, which are sent the river to the ports of the Mediterranean; and trade corn, cattle, and iron. There are seven yearly fairs. here is a handsome bridge over the Saône. Scey, distinuished as Scey-sur-Saône, is a busy little place, with ironorks, and a considerable corn-trade; there is a bridge of rteen arches over the Saône. Scey has six fairs in the ar. At Jussey fine clock and watch works are made; and ere are five yearly fairs for horses and cattle, and the arse woollens and straw hats manufactured in the district. t Faverney trade is carried on in corn and wine. Cottoneaving and dyeing are carried on at Noroy-l'Archevêque, rwise Noroy-le-Bourg. There are many iron-works, potteries at villages and hamlets in the arrondissement.

In the arrondissement of Lure are—Lure, population in 31, 2847; in 1836, 2950; and Villersexel, on or near the non; Grange-le-Bourg, on a tributary of the Marcour, ich joins the Oignon; Héricourt, population 2644 town, 07 whole commune, on a feeder of the Doubs; Faucogney d Luxeuil, population 3570, on the Breuchin; and Cons, on the Lanterne; St. Loup, population 2601 town, 3 whole commune, on the Semousse (called also the one), a feeder of the Lanterne; and Vauvillers, not far the Coney. Lure was antiently celebrated for its bey, founded in the reign of Clotaire II; it became a nedictine abbey, and was secularised in 1764. The subefect occupies the former residence of the abbot. The wn consists principally of one long and very wide street, to which some smaller streets or lanes open; the houses e low, but tolerably well built. The inhabitants have tanrds and dye-houses, and carry on trade in leather, iron, rn, timber, and cheese. There are eight yearly fairs for ttle, draught horses, and straw hats made in the district. ere are a subordinate court of justice, an agricultural ciety, a seminary for priests, and a school of commerce. illersexel or Villers-sexel is in the midst of an ironaking district. Grange-le-Bourg has four yearly fairs r cattle of every kind, woven goods, and straw hats. Héri-urt is a busy town; it has a factory for spinning cottonrn, where steam is the moving power; and various kinds cotton goods are manufactured, also linens, cotton and ollen hosiery, and chamois and other leather. There are e-houses. There is a monthly fair for cattle, straw hats, d hardwares. Héricourt has an antient castle. Faucogney s some cotton and linen manufactures: hones for razors e dug near the town. Luxeuil is pleasantly situated, and s mineral waters which were known to the Romans, who lled the place Lixovium: an inscription found in the ruins the antient baths, and preserved in the town-hall, runs as llows:—LIXOVII . THERM. REPAR. LABIENVS . IVSSV . C. L. CAES. IMP. The baths at present are six in number, pplied from hot and cold springs, and are much frequented. The town was ruined by Attila, but revived on e foundation of a monastery here in the seventh century by e Irish saint Columban, which continued down to the suppression of religious houses at the Revolution. The town was d by the Saracens in the eighth century. The towns- anufacture leather, hats of felt and straw, hardwares, clock and watch works, and tin-plate wares; they have dye houses; and carry on trade in kirschenwasser (cherry-water) fruits, mill-stones, and timber: there are six yearly fairs. St. Loup is in the centre of a considerable manufacture of straw hats; the townsmen also manufacture druggets, currycombs, chamois and other leather; there are oil-presses, flour-mills, a brewery, a tile-yard, and some other works, all comprehended in one vast establishment. There are candle-manufactories, tan-yards, and glass-houses at Vauvillers. There are several important manufacturing establishments at the villages in this arrondissement; there are cotton-mills for spinning yarn, and factories for weaving cotton, one of which, at Vy-les-Lure, near the Oignon, gives employment to five hundred persons; vellum paper, iron goods of various kinds, beer and kirschenwasser are also made in the district. The chief mineral treasures of the department are found in this arrondissement, in which granite, coal, peat, brick-earth, grindstones, and manganese are dug. A considerable quantity of timber and deals are also procured.

In the arrondissement of Gray are—Gray, population in 1831, 5937; in 1836, 6535, on the Saône; Champlitte, population 3535 town, 3835 whole commune, and Dampierre on the Saulon; Gy, population 2848, on the Morte; and Marnay and Pesmes, population 1582, on the Oignon. Gray is not mentioned before the eleventh century; it was fortified in the time of the emperor Charles V., but Louis XIV., on gaining possession of it, demolished the fortifications. The town is built on the slope of a hill rising from the river, and is commanded by the ruins of an antient castle formerly inhabited by the dukes of Bourgogne. The streets are crooked and steep, but the houses are built with tolerable regularity. There are cavalry barracks, a theatre, a fountain, a public walk, an exchange, two hospitals, and several parish churches. Before the Revolution there were as many as eight convents. Some woollen cloth and other articles are manufactured; but the chief business of the town arises from its situation on the Saône, on which river goods are here embarked from different parts of Lorraine, Champagne, Bourgogne, and La Franche Comté, in order to be sent to the south of France; and goods from the south are landed. There are immense mills on the Saône, comprehending, in one establishment, a saw-mill, an oil-mill, a fulling-mill (used also in the preparation of leather), and a flour-mill. The flour is sent down the river chiefly to Lyon and Marseille. The chief articles of trade are corn, hay, timber, deals, wine, iron, and colonial produce. Gray has some government offices, an agricultural society, a college, and a public library. There are four yearly fairs for cattle, horses, woven goods, and straw hats. At Champlitte, linens, druggets, and hats are manufactured; and trade in corn and wine carried on: there is a bleaching-house for wax; and there are five yearly fairs. At Gy, druggets, cotton goods, and vinegar are made, and considerable trade is carried on in wine: there are six considerable fairs in the year. Pesmes has some iron-works and the ruins of a castle: the town is pleasantly situated on a hill sloping down to the Oignon: there are four yearly fairs. Iron-works are numerous in this arron dissement.

The population, when not mentioned to be otherwise, is that of the commune, and from the census of 1831.

This department, with that of Doubs, constitutes the archiepiscopal diocese of Besançon; it is included in the jurisdiction of the Cour Royale and the Académie Universitaire of that city. There is a Lutheran consistory at Héricourt. The department returns four members to the Chamber of Deputies. It is included in the sixth military division, the head-quarters of which are at Besançon.

In respect of education, this department is considerably in advance of the average of the French departments. In 1828-29, of every 100 young men enrolled in the military census, 59 could read and write, the average of France being rather under 40. The inhabitants are generally large and swarthy, remarkable for strength rather than agility, and for courage and perseverance rather than refinement.

In the earliest historical period this part of France was comprehended in the territory of the Sequani, except a portion of the western side of the department, which was included in the territory of the Lingones. These were both, as it appears, Celtic nations, but their country was included in Gallia Belgica on the division of Gaul into four provinces by Augustus Cæsar: the Lingones were however afterwards taken from Belgica and added to Gallia Lugdunensis; upon the subdivision of which they were included in Lugdunensis

Prima. The Sequani, in the subdivision of Belgica, were included in the province of Maxima Sequanorum. The following Roman towns appear to have been included in the limits of the department:—Portus Abucini, and Luxovium or Lixovium, already noticed; Didattium, supposed to be in the neighbourhood of Jussey, at a place where the remains of vast buildings and roads, statues, reliefs, and medals have been found; Segobodium, now Seveux, at the commencement of the navigation of the Saône, above Gray; Velatodurum or Velatudurum, probably on the Oignon, not far from Montbozon; and Amagetobriga or Admagetobriga (the spot where Ariovistus the German defeated the Aedui just before Cæsar's conquest of Gaul), placed by some at the junction of the Oignon and the Saône, just on, or perhaps beyond, the boundary of the department. These were all in the territory of the Sequani. The only town of the Lingones, which is supposed to have been in this department, was Varcia, which appears to have been about 8 or 9 miles north-west of Seveux, on a site not ascertained. In the middle ages this department formed part of La Comté de Bourgogne, or the province of La Franche Comté. [FRANCHE COMTE'.]

SAP, in vegetable physiology, is the fluid which plants imbibe from the soil in which they are placed, and is the great source from which they are nourished, and their various peculiar secretions produced. One of the most important conditions of the growth of plants is, that they be placed in circumstances to absorb from the soil those constituents of which their sap is composed. The constituents of sap may be divided into those which are essential, or necessary for the growth of all plants, and those which are special, or necessary only for the growth of particular plants or families of plants. The elementary bodies which form the essential constituents of sap are carbon, oxygen, hydrogen, and nitrogen. These bodies are capable of uniting with each other and forming a great number of secondary combinations, and are seldom, if ever, absorbed in a pure state by plants. The forms in which they enter the plant and constitute its essential ingredients are those of carbonic acid, water, and ammonia. The sources from whence plants mostly derive these are the soil in which they grow and the atmosphere. It is not precisely known from which of these two sources plants derive the greater proportion of the constituents of their sap. The atmosphere appears to be the great source from whence the carbonic acid and ammonia is supplied, and the soil would appear to supply the greatest quantity of water. But whatever may be the amount of these ingredients absorbed by plants from the atmosphere through the agency of their bark and leaves, all of them are found to enter the stems of plants through absorption by their roots.

The constituents of the sap which are not necessary for the growth of all plants are principally the metallic oxides, which it is well known enter very largely into the composition of some plants. The most common of these are the oxides of potassium, sodium, calcium, and magnesium. These oxides occur in combination with various acids, but the acid is not found to exercise so much influence on the plant as the base. Although any of these oxides when presented in solution would be absorbed by plants, it would be only those adapted to the peculiar habit of the plant that would be appropriated. Thus plants which grow naturally on the sea-shore, and require soda for their growth, will take up potassa when presented to them in combination with soda, but they would reject the potassa by excretion and retain the soda. [ROOT.] The sap therefore which is found in plants varies in composition both from the nature of the soil and the nature of the plant.

From the soil the sap is conveyed by the roots into the plant, and is not long before it undergoes certain changes in its composition, but the nature of these changes, and the period at which they take place, are not well known. It is however a fact that the nearer a tree is tapped to its root, the more fluid is the sap which exudes. The channels through which the sap passes in its upward course are also a subject of difficulty. Various observers have contended for each of the different tissues being the sole conveyor of this fluid, but it is most probable that, with the exception of the spiral vessels, which seem appropriated to the conveyance of air, all the tissues of a plant are engaged in conveying sap. There are some parts which seem to convey more than others, and the younger tissues are always more filled with fluid than the older. Thus, when the trunk of a tree is cut through in spring, sap will [illegible] parts of the cut surface, but in [illegible] alburnum or sapwood, the most recently [illegible] the timber.

By whatever channels the sap pursues [illegible] we find that it undergoes great changes b[illegible] of its absorption from the soil and its [illegible] in the secretions of the plant. The most [illegible] changes is the loss of a large portion of [illegible] possessed when first absorbed. This [illegible] process of exhalation, which is not the [illegible] the water, but consists in a vital process, w[illegible] be analogous to insensible perspiration in an[illegible] way it has been ascertained that a common [illegible] feet in height, will lose one pound four [illegible] every day; and a common cabbage one pound [illegible] Hales contrived to measure the force with [illegible] haled during the summer, and [illegible] plants it was five times as great as [illegible] blood in the crural artery of a horse. T[illegible] in which this process goes on most rapidly [illegible] from its extensive surface and delicate [illegible] adapted for the performance of the [illegible] pose however the leaf is endowed w[illegible] called stomates. The stomates are [illegible] cuticle of the leaf, the number of wh[illegible] in different leaves, and the process of [illegible] direct proportion to their number. [illegible] principally during the day, under the i[illegible] of the sun, and almost completely ce[illegible] are withdrawn. It is on this acc[illegible] rapidly their freshness on exposure to the [illegible] when they have been plucked, or [illegible] means of obtaining a fresh supply of water. [illegible] pical climates is thus kept constantly [illegible] plant by the loss of moisture from its [illegible] stant supply of fresh juices from the [illegible] may be taken advantage of in ho[illegible] ing, which should be avoided in ho[illegible] plant is full of leaves, as under th[illegible] would be likely to be destroyed by [illegible]

Subsequently to the process of ex[illegible] leaves was at one time supposed to [illegible] lar to that of respiration in animals, [illegible] carbon of the sap united with the ox[illegible] carbonic acid, was given off. This proc[illegible] place in the upper surface of the lea[illegible] cluded that the upper layer of cells in [illegible] to respiration, and the under to digesti[illegible] that plants respired as well as animals [illegible] the fact of plants constantly giving ou[illegible] carbonic acid gas, especially at night. [illegible] arises from the carbonic acid which pla[illegible] entirely decomposed, and again retur[illegible] sphere. Whilst the sap is in the leaf, a[illegible] takes place which has been called digesti[illegible] cipally in the decomposition of carbonic acid, [illegible] its oxygen into the air, and the combin[illegible] with other elements to form the various [illegible] plant, such as gum, sugar, starch, lignine, [illegible] VEGETABLE.] The mode in which th[illegible] introduced into the leaf was at one [illegible] from the union of the carbon of the sap with [illegible] the atmosphere; but from the statemen[illegible] whole of the carbonic acid could not be derived [illegible] source, as plants can always be made to pr[illegible] bon after their growth than was contained in [illegible] which they grew. By calculations on an exte[illegible] Liebig proves that there must be some [illegible] dependent of the soil. Besides this, as [illegible] matter in the soil must have been o[illegible] plants, it is necessary that the first pl[illegible] some other source of carbon. This source [illegible] which is constantly supplied with carbonic acid [illegible] breathing of animals and other means, and is [illegible] abundant magazine of food for the vegetable [illegible] this way plants perform a very important [illegible] economy of creation. The carbonic acid [illegible] lating in the atmosphere, would become inju[illegible] life, is removed; and not only is the [illegible] removed, but it is decomposed; and the [illegible] it contains, and which is as essential to [illegible] bonic acid is injurious, is given out.

The necessity of light for the carrying on the processes of halation, the absorption and decomposition of carbonic d, and the fixation of carbon, is seen in the result of icing plants in the dark. In the first place their stems ome weak from the accumulation of water and the ab- ice of solid secretions; and in the second place they lose ir colour, or the young shoots are entirely destitute of it. knowledge of this fact is made use of in horticulture for purpose of rendering those plants available as articles of t that would otherwise be too tough and acrid for the le. This is the case with celery, asparagus, &c., the rts which are eaten of these plants having been excluded m the influence of light under the soil in which they w. This process is called etiolation, and all plants may made to partake more or less of this quality by a total or rtial withdrawal of the light. The loss of colour arises m an insufficient fixation of carbon, of which the green ouring matter of the leaves is composed. This colouring tter exists in the form of globules in the cells of cellular sue, and is there called *chromule*. It is probable that the ried and beautiful colours of the flowers of plants are de- ndent on some modifications of the same substance.

From the period that the sap is absorbed by the roots to time that the various secretions of the plants are elabo- ed, it is in a state of constant motion. This motion is led the circulation of the sap, but it is not intended to vey by the term circulation the idea that the movement the fluids of plants is similar to that which takes place the blood of animals, which is constantly sent out from d returned to a central point. The motions of the fluid plants are of two kinds, general and special. The general tions of the sap are those of ascent and descent, both of ich may be rendered apparent by cutting through the nk of a tree, when not only the cut surface below will sent an exudation of juice in its ascending course, but cut surface above will present fluid that is descending. e existence and amount of the fluids thus circulating in nts has been demonstrated by an ingenious apparatus ented by M. Biot. By means of a groove in the lower face of a hole in the stem of a tree, and a little trough lied to the upper surface, he measured the amount ascending and descending juices, and also the influence external circumstances upon the flow of the fluid. It s observed by M. Biot that the descending current is more ase and saccharine than the ascending, although this is ject to slight alterations during rain. Light is the prin- al agent in modifying the flow. Mild weather facilitates ascent of the sap; and a sudden cold, by contracting the e, appears to promote its descent. If the cold continues, ground hardens, and the sap again ascends. If a thaw ceeds a frost, the roots require replenishing, and a down- rd current is established. The ascent of the sap, which o strong in spring, ceases when the leaves are fully ex- ded. After the middle of summer, the sun's rays have power, the leaves also are obstructed by the deposition of retions, the whole tree attains a state of plethora, and re is then an increase of the descending juices.

The cause of the progression of the sap in plants has ever n a fruitful source of speculation. Malpighi supposed that depended on the contraction and dilatation of the air en- sed in the air-vessels. Borelli attributed it to the con- sation and rarefaction of the air and fluids of the plant. Hamel, who was also supported by Linnæus, accounted it by the agency of heat. Hales demonstrated the in- ficiency of this principle, but did not adopt one less ectionable. Capillary attraction has long been a favourite ory in explaining these motions, but it is liable to the same ections that all purely physical theories are, with regard the movements of the fluids in plants and animals. Those anists who have referred these movements to a vital ency have not been more happy. Brugmanns, Coulon, ussure, and others adopted the theory of vegetable irita- ity. The vessels in which the sap was contained were posed to be susceptible of the action of stimuli, and when sap, which acted as a stimulus, was applied to them, the sels contracted and the sap was propelled. Knight erred the propulsion of sap to contraction and dilatation of the vessels, but of the medullary plates or rays. t the most recent theory and that which has received sanction of the largest number of botanists, though far m being unobjectionable, is that of Dutrochet. He attri- tes the motions of the sap to the action of Exosmose and dosmose. [ENDOSMOSE.]

The special motions of the juices of plants are of two kinds, the first called rotation, the second cyclosis.

1. It is now nearly a century ago since Corti observed a rotatory movement of the sap in the cells of Caulinia fragilis, an Italian plant, and his observations were subsequently followed up by Amici, Fontana, and Treviranus, especially the first. It was ascertained by these observers that this motion was not at all confined to the plant in which it was first seen, but that it existed in many others, as Valisneria, Hydrocharis, Potamogeton, &c. But of all the plants in which it exists, it may be seen to most advantage in the Chara. Some of the species of this genus are common in Great Britain, and are found inhabiting ponds and ditches The whole stem of these plants is covered with an incrustation of carbonate of lime, which is attached to their epidermis, and which must be scraped off before the cells can be exposed. If the cells thus exposed be examined with a microscope of the $\frac{1}{10}$th of an inch focal length, or even less, the movement spoken of may be easily witnessed. It is then found to consist of the constant motion of a number of little green globules, varying in size, which pass up on one side, and turning round the top of the cell, pass down the other side, and again ascend. According to Meyen, these globules are composed of various substances, the larger ones being grains of starch, others little bladders coloured by chlorophyle; and some, drops of oil. The currents which these globules indicate are entirely confined to the cell in which they occur, the motions in one cell not in any manner interfering with those in the next. Meyen states that the direction in which the globules move is in some measure dependent upon the internal structure of the cell, which is clothed with a number of little green bodies arranged sometimes in a longitudinal and sometimes in a spiral direction. The movement of the current is always on a line with these bodies, which are mostly arranged longitudinally in the young cells and spirally in the older ones. The rapidity with which the globules move in the cells depends in some measure on the age of the plant, but it mostly fails in proportion to the time which it has been withdrawn from connection with surrounding parts. The motion is increased by a range of temperature between 55° and 77° Fahr., and decreased by a greater amount of cold or heat. The motion may frequently be restored after it has stopped, especially in cold weather, by immersing it in warm water. According to Schulz this motion is also visible in the Algæ, Fungi, Lichens, Mosses, Naiadaceæ, Podostemaceæ, Zosteraceæ, Hepaticeæ, Lemna, and Ceratophyllum. It is not observed in the higher forms of plants, but in these its place appears to be taken by the second kind of special motions, of which we shall now speak, called Cyclosis.

2. Cyclosis is a motion of the fluids of plants which was first described by Professor Schulz of Berlin. Although his views on this subject have long been before botanists, it was not till 1839 that his essay 'Sur la Circulation et sur les Vaisseaux Laticifères dans les Plantes' was published. It was to this essay that the physical prize of the Royal Academy of Sciences of Paris was awarded in 1833.

According to Schulz, this motion of the sap takes place in a peculiar kind of tissue called cinenchyma, or laticiferous tissue. [TISSUES, VEGETABLE.] This tissue is composed of vessels which are observed in three different states. —1, broad and expanded; 2, narrow and contracted; 3, articulated. These forms are capable of passing one into the other, and are met with in the same plant. They appear to be the same vessels as those described by Malpighi and Moldenhawer under the name of *vasa propria*. These vessels as described by Schulz are found in nearly all the exogenous and endogenous plants, and always in those which possess spiral vessels. In those families or species which do not possess spiral vessels, the intercellular rotation is found taking the place of cyclosis. The parts of the plant in which the laticiferous tissue is most easily observed are the root, stem, petiole, peduncle, and flower. It is easily found in the stipules and bark of the fig, in the valves of the fruit of Chelidonium, the bark of Acer platanoides, and the interior of the sepals of Calistegia sepium. It is most easily seen in young plants.

Through this tissue a fluid passes, sometimes clear, but more frequently milky, to which the name of *latex* is given. The latex appears to be a portion of the fluids of the plant more slightly organised, and separated from the rest. It is viscid, insoluble in water, coloured mostly white but sometimes yellow, red, and brown, and is often transparent. It abounds with minute globules which give it its colour, and according to Schulz constitute the living part of the latex. These globules oscillate in the latex, and when the latter is separated from the plant, they coagulate, and leave a fluid lymph or serum. This property is not found in other vegetable secretions, and in this respect presents a remarkable similarity to the blood of animals. In fact the latex seems to bear the same relation to the system of the plant that the blood does to the system of the animal, and to be the immediate source of the various secretions of plants.

The cause of these special motions, like that of the blood in the capillaries of animals, is involved in much obscurity. That they should continue, several conditions are necessary, such as heat, light, and all those circumstances essential to the existence of vital irritability in plants, but none of these can be assigned as a true cause. Under such circumstances perhaps it is better not to speculate on the cause, but rather to observe the facts.

SAP is a mode of executing the trenches at the siege of a fortress, when the besiegers arrive within such a distance from the covered-way that the fire from thence becomes too dangerous to allow the men to work on the ground without being protected by some covering objects, as gabions, placed between themselves and the enemy.

The process of sapping varies with the distance from the works of the fortress and the degree of activity with which the fire of the defenders is kept up. It is therefore divided into what is called the *flying sap* and the *complete* or *full sap*. In ordinary circumstances the first begins to be used in forming the second parallel trench, which may be about 320 yards from the covered-way; and it is executed in the following manner.

If the distance from the depôt of siege-materials to the place of the intended trench is not too great, every man carries two gabions, one on each side of him, or both slung at his back; he carries also a pickaxe and a spade, and in the first case these are fixed in the gabions, but in the latter he carries them in his hands. If the distance which the working party has to march is considerable, this burthen would be too fatiguing, and then each man carries on his shoulder one gabion together with a pickaxe or a spade. The work is begun at a night, and when the sappers have arrived at the ground where the tracing-line for the intended trench has been laid down, they set up their gabions a few inches in front of that tracing-line, the officers observing that the row of gabions in its whole length is correctly placed. The portion of trench to be executed by each sapper, or workman, is equal in length to the space covered by two gabions (about 4 feet); the men sit down or otherwise keep themselves covered till the order is given to commence digging, and when the number of men who constitute the working party is greater than suffices to allow one man to every two gabions, those who have not room to work retire to a little distance till they are required to relieve the others. A man may fill his two gabions with earth in about a quarter of an hour, and then they will be proof against a musket bullet, except at the place where they touch each other; after this the earth obtained in executing the trench is thrown beyond the gabions towards the fortress. During the progress of the work the gabions are pushed a little way outwards at the top, in order that they may effectually resist the pressure of the earth which they are to retain; and they are sometimes crowned by two or three rows of fascines which are laid upon them in a direction parallel to the trench.

If the work proceeds by day and night, the parties are relieved every eight hours; and a trench executed by flying sap may, in soil of medium tenacity, be completed by three reliefs of men.

When the approaches of the besiegers have advanced so near the covered-way that the fire of the defenders will no longer permit the men to bring the gabions openly to the ground, the full sap is practised. For this purpose the sappers are divided into brigades of eight men each; and of these a demi-brigade only of four men is employed in the formation of a single line of trench. The party is provided with a mantelet (a plate of iron thick enough to be musket-proof, and capable of being moved forward by being mounted on small wheels) by which the men may be covered in front; or, instead of this machine, there is provided for the same purpose a great gabion called a sap-roller. This is a cylinder of basket-work, 6 feet long, and about 4 feet diameter, and having within it a gabion of equal length, but about 2 feet 6 inches diameter; the axes of [illegible] coincident, and the space between the [illegible] the interior of the other is stuffed with [illegible] means it is rendered musket-proof. The sap-[illegible] on its convex surface is found to be more [illegible] the mantelet; and when it is intended to [illegible] any proposed direction, by breaking out [illegible] has been already executed, it is raised o[illegible] the latter trench, and gradually lowered [illegible] side, being guided by means of a hook, so [illegible] a position perpendicular to the line of the [illegible] The leading sapper of the demi-brigade th[illegible] the parapet, and pushing the sap-roller for[illegible] he hastily places an empty gabion in rear [illegible] of the sap-roller which is nearest to [illegible] order that he may be covered on his [illegible] behind the gabion, he excavates a portion of [illegible] inches wide, and as many in depth, leavi[illegible] 12 inches broad between the gabion and the excavation, and throwing the earth [illegible] When this portion is dug, the sap-roller is ad[illegible] feet farther, and another gabion is set up [illegible] cent to the former, and in the line of the [illegible] a short fascine, or two sand-bags (bags full of [illegible] placed one above another in the hollow between [illegible] gabions, in order that a musket-ball may not be a[illegible] netrate through the screen in that part. [illegible] excavates as before, and having filled the [illegible] third is handed to him, which he places and [illegible] tinues to advance. The second sapper of [illegible] the first, keeping a little way in his rear. [illegible] width only of the trench by 20 inches [illegible] farthest from the line of gabions, and [illegible] earth into and beyond the gabions. T[illegible] third [illegible] and increases the depth only by 18 inc[illegible] inches measured from the rear side o[illegible] the gabions; and the fourth sapper exca[illegible] deep, increasing the breadth of the trench [illegible] by 10 inches. By this arrangement the ta[illegible] ent men are rendered nearly equal, and c[illegible] obtained when the work of the third man [illegible] four men thus form a trench 4 feet w[illegible] and a step is left on the side nearest to [illegible] venience in standing to fire over the parapet [illegible] parties from the infantry of the line after[illegible] trench by increasing the width to its usual [illegible] feet.

Since the head sapper has the most [illegible] second, third, and fourth sappers relieve [illegible] taking his place; and the work advances about [illegible] per hour, according to the tenacity of the earth.

If the fire of the place should be considerably subdued by the action of the besiegers' batteries, the full and flying sap may be combined in order to expedite the approach. Thus a party of sappers advancing on their hands and knees, and rolling gabions before them, on arriving at convenient places set up the latter in line; then two or three men, at certain intervals from each other, dig pits behind the gabions, in order to get cover, and afterwards work towards each other, making a small trench, and filling the gabions with earth. The trench may subsequently be made of the required width.

When the distance to be passed over is short, the [illegible] trench is carried on directly towards the [illegible] by a simple trench, with traverses at inte[illegible] times by what is called the double sap. Th[illegible] by two squads or demi-brigades, who work [illegible] other, each being covered in front by its ow[illegible] there is a third roller in rear of the small [illegible] the others. A row of gabions is placed o[illegible] trench executed by one squad, and on the [illegible] is executed by the other: the distances be[illegible] gabions is about twelve feet, and traverses [illegible] trench at intervals as the work advances. [illegible] alternately from opposite sides, so as to leave [illegible] passage along the trench.

SAP-GREEN, a pigment, prepared by evapo[illegible] juice of the berries of the *Rhamnus catharticus*, [illegible] thorn, to dryness, mixed with lime. It is soluble in water, less so in alcohol, and insoluble in æther and oils. Acids redden it, but the alkalis and alkaline earths restore the green colour.

SA'PAJOUS, the name generally given to a group of nerican monkeys, including in its larger sense the Sapajous [ATELES; LAGOTHRIX], and the other (*Cebus*, Geoff.). These last, which are termed ıave the head round, the thumbs distinct, but ›pposable on the fore hands, and the tail entirely rith hair, although still prehensile.

›ecies are very numerous, and Cuvier truly says, are nearly as difficult to characterise as those of ·ican Howlers. [MYCETES.]

hole of the *Sajous* are very active, climb admid are altogether well formed for an arboreal life. -hands suffer by comparison with those of the Old ıonkeys, and exhibit a less perfect organization. ıb is longer, but is more on a line with the other The palms both of the fore and hinder extremities ved with great sensibility. Small in size and playful sition, the Sajous lead a gregarious merry life, hiefly on fruits and insects. The facial angle is

the most common species is the *Weeper* (*Cebus* but why it should have obtained this dolorous title is clear, for when confined it is good tempered, playhardy. The fur is rather rich, inclining to olive, olden tinge on the lighter parts; and the face is with a paler circle, varying considerably in shadreadth, being nearly wanting in some individuals. ies has been known to breed in confinement.

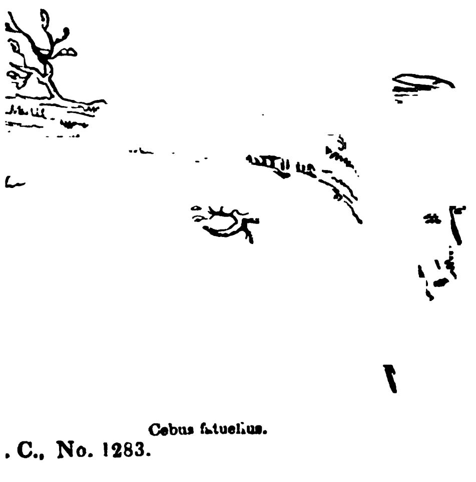
ɔldt describes another species, *Cebus albifrons*, the *vi des catarractes*, about the same size as the last, eyish-blue face, excepting the pure white orbits and The colour of the rest of the body is greyish-olive; ue is lightest on the back and belly.

y, Habits, &c.—The distinguished zoologist above ound this pretty species living in troops in the ar the cataracts of the Orinoco. Mild and active, often kept by the Indians as playthings, and are ertaining. Thus Humboldt saw one domestihy at Maypures that caught a pig every morning, uim about while he was feeding in the savanna the y. Another in the house of a missionary bestrode ch had been brought up with it and patiently sub the rider.

ɔceed to illustrate this group by two species.

us fatuellus.

otion.—In this, the *Sajou cornu* of the French, *Sapajou* of the English, *Simia fatuellus* of Linhave a variety of the form marked by the extradirection of the hair on the forehead. Colour, in p brownish or purplish black; in others, reddish brown. The skin on the naked parts dark purple. The hair of the forehead stands up like a crescent, or a waterman's cap with the front elevated. When viewed in front it exhibits the appearance of two horns. The tips of these erect hairs and of those on the cheeks are paler.



Cebus fatuellus.

There is a variety with more white about the tufts and jaw.

Locality.—French Guiana.

2. *Cebus monachus.*

Description.—This, the *Saï à grosse tête* of the French, *Large-headed Sapajou* of the English, has no frontal tuft like the last. On the contrary the head is covered with short whitish hairs of a shorn appearance. The breast and belly, sides of the cheeks, and all the front, yellowish white. Fore-arms, hinder extremities, and tail, black. Irregular patches of black and brown cover the rest of the body.

Cebus monachus.

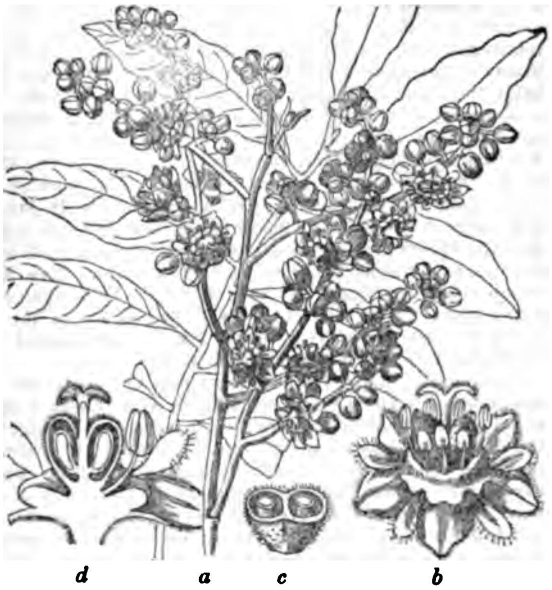
Fifteen or sixteen species are recorded of this the most numerous group of the American monkeys. They may be considered as representing in that continent the GUENONS of the Old World, which are also very numerous.

SAPAN-WOOD, a dye-wood which is yielded by a species of Cæsalpinia, as Brazil-wood is by *C. braziliensis*, found in the West Indies, and by *C. echinata*, a native of Brazil, and which is imported from various parts of the West Indies and South America. Sapan-wood, which is similar in properties, is a produce of Asia, and yielded by C. Sapan, a thorny tree which has been fully described and figured both by Rheede and Rumphius. It is a native of the southern parts of India, of Siam and Pegu, as well as of the various islands of the Indian Archipelago, Philippines, &c. The wood has been used as a dye-wood from very early times in India, and is described as a medicine in Persian works, under the name *bookum*, derived from its common Indian name, while it is also known by that of *puttung*, derived from the Sanscrit *patanga*. Sapan is its name among the Malays, according to Rumphius. .

According to Dr. Bancroft it found its way into Europe some time before the discovery of America, and it still continues to be imported. Its colouring-matter differs little from that of Brazil-wood, but the best sapan-wood does not yield more than half the quantity that may be obtained from an equal weight of Brazil-wood, and the colour is not so bright. (Bancroft.) Brazil-wood therefore brings more than double the price, the latter selling for 30*l.* and upwards a ton, and the Sapan-wood from 12*l.* to 15*l.* The import of Sapan-wood into Calcutta amounted, in 1837-38, to 16,172¾ bazar maunds from Pegu, Singapore, Bombay, and China. Of this 4450½ maunds were re-exported to Great Britain.

SAPINDA'CEÆ, a natural order of plants belonging to the calycose group of polypetalous Exogens. It consists of trees or shrubs, rarely herbaceous plants, with erect or climbing stems, with alternate often compound leaves, rarely simple, with or without stipules, and often marked with lines or pellucid dots. Their inflorescence is racemose or paniculate, with small white or rose-coloured rarely yellow flowers, which are seldom barren or hermaphrodite. The calyx consists of 4-5 sepals, slightly cohering at the base. The petals are the same in number as the sepals, one being occasionally abortive. They are in general furnished with a petal-like scale, but are sometimes naked. They have a fleshy glandular disk occasionally occupying the base of the calyx. The stamens are definite, about twice the number of the sepals. The filaments are free or slightly connate, the anthers 2-celled. The ovary 3-celled, rarely 2-4 celled, the cells containing 1-2-3 ovules. Style undivided, or more or less deeply 2- or 3-cleft. The seeds have usually an aril, are without albumen, and have a curved or spirally twisted embryo. They are inhabitants of most parts of the tropics, more especially of South America and India. They are not found in Europe or the United States of America. One genus is found in New Holland, Dodonea.

This order is closely allied to Aceraceæ, from which they only differ in their alternate leaves and petals. The number of their stamens eight, with five unequal sepals, point out a relation with Polygalaceæ. Their climbing habit and tendency to produce tendrils give them a remote relation to Vitaceæ. In this order, although the leaves, branches, and other organs act in a deleterious manner, yet their fruit and seeds are eatable and wholesome. The Litchi and Longan, favourite fruits in China, are produced by the genus Euphoria. These fruits are sweet, with a subacid flavour, and when dried are sometimes brought to this country. They are considered a great luxury in China, and are sent at a great expense from the provinces of Fokien and Quan-tong, where they grow, to Pekin, for the consumption of the emperor. Several other genera bear fruits which are very delicious, and are eaten in Japan and Brazil. The Sapindus is remarkable for bearing a pulpy fruit, the outer part of which has been used, on account of its detergent properties, as a soap. [SAPINDUS.] Some of the species of this genus also produce eatable fruits. Paulinia is another genus which has poisonous properties residing in the leaves and other parts of the plant, whilst the fruits are eatable. The whole of the order partakes more or less of these properties.



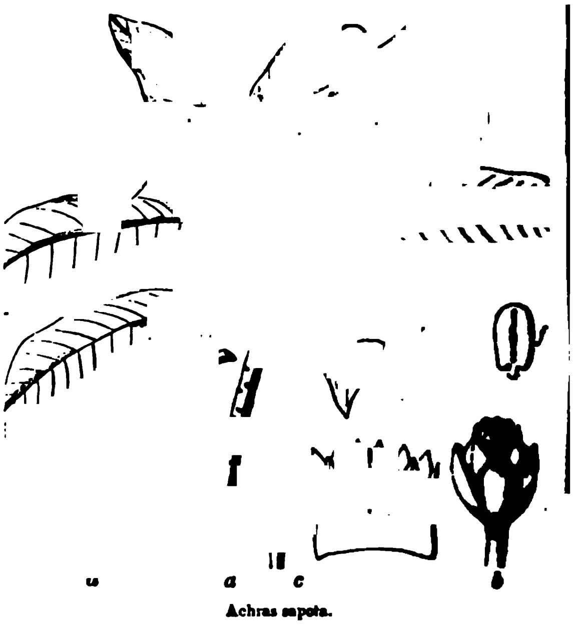
Euphoria longana

a, branch with racemose flowers and alternate leaves; *b*, flower showing the disk, stamens, petals, &c.; *c*, transverse section of ovary; *d*, longitudinal section of flower and fruit, showing divided stigma, erect ovules, disk, petals, and calyx.

SAPINDUS, contracted from Sapo Indicus, or Indian soap, and applied to a genus of plants of the natural order of Sapindaceæ, which has been so called in consequence of the berries of many of the species being employed for the same purposes as soap. The genus is tropical, containing between twenty and thirty species, which are found in the tropical parts both of the Old and New World. It is characterised by having the calyx 4- to 5-partite; petals as many as the sepals, a little longer, naked or hairy, or with a scale above the claw. Torus or disk occupying the bottom of the calyx. Stamens 8 to 10, inserted [illegible] gin of the disk and ovary. Ovary 3- rarely [illegible] 1, erect at the base of each cell. Style [illegible] 2-lobed stigma. Fruit fleshy, 1-2 rarely 3- [illegible] 1- to 2- rarely 3-seeded, with the seeds fu [illegible] aril. The species consist of trees having leaves [illegible] pules, with the inflorescence in racemes [illegible] cles. Flowers small, white, or greenish [illegible] red and saponaceous, on which account they have [illegible] ployed for washing woollens and clothes of [illegible] different countries. For instance, in the West [illegible] continent of America, S. saponaria yields [illegible] soap-berries, and in Java, S. rarak; so in [illegible] species, as S. acuminatus, laurifolius, ema [illegible] detergens, yield berries which are called *reeth* [illegible] dried state may be bought in every baz [illegible] everywhere employed as a substitute for [illegible] part of these berries is viscid, and in [illegible] shining semi-transparent appearance; when [illegible] water, they form a lather like soap. This is [illegible] presence of a principle called by chemists [illegible] is often united with an acrid principle, whence [illegible] are said to injure cloth which has been much [illegible] them. The bark and root have similar prope [illegible] been employed for the same purpose, as well [illegible] in the countries where they are indigenous. [illegible] which are about the size of cherries, encl [illegible] nuts, which used formerly to be much [illegible] ployed as buttons for waistcoats, after ha [illegible] with gold, silver, or other metal. The [illegible] contains an edible oil, which is somet [illegible] burning. The fruits of S. senegalensis [illegible] are eaten, and the wood of some species, as of [illegible] is close-grained and hard, and forms valuable [illegible]

SAPODILLA. [SAPOTACEÆ.]

SAPOTA'CEÆ, or **SAPO'TEÆ**, a natural order of plants belonging to the polycarpous group of monopetalous Exogens. It consists of trees and shrubs, which abound with a milky juice; the branches are round; the leaves alternate, simple, entire, coriaceous, destitute of stipules; their undersides being covered by a silky or downy pubescence. The flowers are axillary, regular, and united; the calyx is 4-[illegible] cleft, imbricate in æstivation; the corolla is hypogynous, regular, and cleft; the lobes are equal in number to the sepals and alternate with them; the stamens are definite and distinct, some are barren and some fertile, the former being alternate with the sepals, the latter opposite; the ovary is superior, with several cells, in each of which is one ovule; style single; stigma undivided; se [illegible] sometimes cohering into a several-celled putamen, [illegible] large, erect, and enclosed in fleshy albumen. This [illegible] of plants is most nearly allied to that of Eb [illegible]



Achras sapota.

a, branch with axillary flowers; *b*, flower, showing the imbricate [illegible] *c*, pistil with style and simple stigma; *d*, fruit (sapodilla plum); *e*, [illegible] *f*, embryo hich it agrees in habit, its monopetalous regular hypogyous corolla, the absence of a hypogynous disk, its severalelled ovary, and definite ovules and stamens. It differs owever in the possession of milky juice, soft wood, hermahrodite flowers, undivided stigma, and 1-seeded ovary ith erect ovules. The plants of this family are chiefly atives of India, Africa, and America. Some of the species roduce fruits which are much prized as articles of diet. mongst these is the sapodilla plum, or naseberry, which is e produce of Achras sapota. The star-apple, marmaude, the medlar of Surinam, and other eatable fruits are erived from plants belonging to this order. Most of the pecies yield large quantities of a milky juice, which, une the secretions of most lactescent families of plants, y be used for alimentary purposes. The fruit and seeds bound in oil, which is solid like butter, and has a mild leasant flavour. [Bassia.] The bark of some species of chras is astringent and tonic, and has been recommended a substitute for quinine.

APOR. [Persia—*History*.]

PPERS AND MINERS, ROYAL, the non-comsioned officers and privates of the corps of Royal Engiers. They are employed in building and repairing peranent fortifications, in raising field-redoubts and batteries, making gabions and fascines, in digging trenches [Sap], d executing galleries of mines during sieges, and also in ng bridges of rafts, boats, and pontoons.

e troops belonging to the department of the engineers ere first embodied at the termination of the war between eat Britain and her American colonies, and they then reived the designation of Royal Military Artificers. The ke of Richmond, who was at that time master-general of e ordnance, formed them into independent companies, and used them to be stationed chiefly at Portsmouth, Plyouth, Chatham, Dover, and Gibraltar. In the year 1807 e Military Artificers constituted a corps of 32 companies, ch consisting of 126 men; and a sub-lieutenant was atched to each company, which was placed under any senior ptain of engineers who might happen to be where the mpany was stationed. But the want of a proper organiation, and of officers permanently attached to the troops, radually brought on a relaxation of discipline and a nelect of the particular duties for which the men were inended; it is even said that when detachments were to be rawn from the companies for any intended expedition, the ngineer officers who selected the men sent only those who ere the least efficient, and that consequently, during the rst years of the war against the French in Spain, the serice suffered much from the inexperience of the troops of his class.

After the failure of the attack on Badajoz in 1811, it was roposed to select some companies from the corps of Royal ilitary Artificers, and to form them into a body expressly or the purpose of executing field-works; and in the following year this proposal was carried into effect. Lieutenant-General Mann, who was made inspector-general of fortiications, obtained permission to have the name of the whole orps changed into that of Royal Sappers and Miners; and ord Mulgrave then formed at Chatham the institution at hich the men have ever since been regularly instructed in ll the duties connected with military engineering. The unior officers of engineers were at the same time appointed o act as the regimental officers of the companies. This institution has been from the first (April, 1812) under the irection of Colonel Pasley, a meritorious officer, who as an ngineer had previously distinguished himself in the service f his country.

A detachment, consisting of 300 men, was sent, in 1813, o perform the duty of sappers and miners at the siege of t. Sebastian, where they rendered essential service. In 814 a brigade of engineers was attached to every division f the army; each brigade consisted of a company of sappers nd miners, with horses and carriages sufficient to convey he tools necessary for the work of 500 men; and five companies of sappers and miners served with the pontoon train, which consisted of 80 pontoons, with the forges, waggons, . The whole corps was under the orders of a brigadejor of engineers.

From 1812 to the peace in 1814, the corps of sappers and miners amounted to 2861 men; and during the hostilities in 18.5. it consisted of 2421 men. At present it consists of 13 companies, each of 68 men; and, besides the regular course of instruction in sapping, mining, making gabions, fascines, &c., the men are taught the most elementary principles of fortification, the manner of drawing plans and sections of buildings, and, to a certain extent, the art of land-surveying. Several of the companies are employed in the Colonies in the exercise of their professional duties; and of those which remain in this country, some are engaged under the officers of engineers in the mechanical operations connected with the survey of Great Britain and Ireland which is being carried on by the Board of Ordnance; parties of the corps also regularly attend the Royal Military College at Sandhurst and the East India Company's seminary at Addiscombe, where they execute, for the instruction of the gentlemen-cadets, the several works connected with the practice of field-fortification. It ought to be mentioned that the troops of the corps have invariably, in whatever part of the world they have been employed, conducted themselves as intelligent men and steady soldiers.

SAPPHIRE. [Corundum.]

SAPPHO was a native of the island of Lesbos, though the exact place is uncertain, for according to some she was born in Eresus, and according to others in Mitylene. The time of her birth is also unknown, and there are few events of her life which can be exactly ascertained. Her own fragments, as well as those of Alcæus, show that these two greatest poets of the Æolic school were contemporaries, though Sappho must have been younger than Alcæus, for she was still alive in 568 B.C., as may be inferred from the ode that she addressed to her brother Charaxus, in which she reproached him for having purchased Rhodopis, the courtesan, from her master, and having been induced by his love for her to emancipate her. (Herod., ii. 135; Athen., xiii., p. 596.) Charaxus bought Rhodopis at Naucratis in Egypt, and in all probability not before the reign of Amasis, who ascended the throne in 569 B.C. Before this time, and when she was still in full possession of her beauty, she is said to have left her country for Sicily, but the cause of this flight is unknown. (Marm. Par., *Ep.* 36; Ovid, *Heroid.*, xv. 51.) It was formerly a common belief that Sappho destroyed herself by leaping into the sea from the Leucadian rock, in despair at her love being unrequited by a youth named Phaon. It is true that in her odes she frequently mentioned a youth whom she loved, who did not return her love, but there is no trace of the name of Phaon in any of her poems; and if the name did occur, it was probably the name of Adonis, the favourite of Venus, who was in some legends called Phaon or Phaeton. It is therefore not unlikely that the manner in which she described Venus addressing Phaon may have given rise to the story of her own passionate love for Phaon. The story of her 'leap from the Leucadian rock' is likewise, as O. Müller and others have shown, a mere fiction which arose from a figurative poetical expression, for the phrase appears to have been used by some poets to express a violent love from which relief is sought by a leap from the Leucadian rock into the sea. It is not expressly stated by any of the antients who tell the story, whether Sappho terminated her life by the leap or whether she survived it.

The genuine sources of information as to Sappho are the fragments of her own poems and some of Alcæus, and in reading them it should not be forgotten that Sappho belonged to the Æolian race, which at the time when the state of society in Attica had assumed a totally different aspect from that of the Heroic age, still retained much of the simplicity of antient Greek manners. At Athens women lived in the strictest seclusion, and the free intercourse of women of ability, such as Sappho and her numerous friends, would lead to the opinion among Athenians that she led an immoral life. It is now superfluous to vindicate the personal character of Sappho, for this has been satisfactorily performed by F. G. Welcker, in a little work called 'Sappho von einem herrschenden Vorurtheil befreit,' Göttingen, 1816.

With the exception of one complete ode and a considerable number of short fragments, the poems of Sappho have perished; but what we possess is sufficient to justify the admiration of the antients. In warmth and purity of feeling, in grace and sweetness, and in delicacy and beauty of diction, she has perhaps never been excelled by any lyric poet either of antient or modern times. The loss of her works is perhaps as much to be lamented as that of any other antient author whose writings have perished, for besides the pleasure that might have been derived from them as works of art, they would undoubtedly have thrown much light on the condition and social relations of women in some parts of Greece, a subject now involved in great obscurity. The antients divided her poems into nine books, which consisted of erotic odes, epithalamia, hymns to the gods, and other poems. The rythmical construction of her odes was essentially the same as that of Alcæus, though with many variations, and in harmony with the softer character of her poetry. There is a verse called the Sapphic verse, which derives its name from the Greek poetess, and which she is said to have invented. The verse is as follows:—

- ⏑ - ⏓ / - ⏑ ⏑ - ⏑ - ⏑

The Sapphic strophe consists of three Sapphic verses followed by a versus Adonicus. It has been very frequently imitated by poets of antient as well as modern times.

The fragments of the poems of Sappho are generally printed together with the poems ascribed to Anacreon. The best separate editions are: 'Sappho Lesbia, Carmina et Fragmenta, rec. comment. illustr. schemata musica adj., &c., H. F. M. Volger,' Lipsiæ, 1810, 8vo.; Sappho, 'Fragm. Specimen Operae in omnibus artis Graecorum Lyricæ reliquiis, &c., proposuit C. F. Neue,' Berlin, 1827, 4to. The best German translation is by K. L. Kannegiesser, Berlin, 1827. (Müller, *Hist. of Greek Lit.*, i., p. 172-180; Bode, *Geschichte der Hellenischen Dichtkunst*, vol. ii, pt. 2, p. 411, &c.)

SAPY'GIDÆ, a family of Hymenopterous insects of the section *Fossores*, the species of which are chiefly distinguished by the feet, in both sexes, being slender, and little or not at all spinose; the antennæ are at least as long as the head and thorax together, and generally increase in thickness towards the extremity. In the genus *Sapyga* the eyes are deeply emarginate; the antennæ are subclavate, slightly curved outwards at the apex in the males, straight in the females, and inserted in a cavity at the base of the clypeus, with an elevated ridge between them; the superior wings have one marginal cell, which passes beyond the third submarginal, and is acuminate; and four submarginal cells, the second the smallest and receiving the first recurrent nervure, the third receiving the second, and the fourth apical.

The species of this genus are usually of moderate size. The females are said to form holes in the mortar of walls, or in putrescent wood, in which they deposit their eggs with food to supply the larvæ. Latreille supposes them to be parasitic upon some of the wild bees; and Mr. Shuckard observes that he has caught the *Sapyga punctata* (a species found in this country) entering the cells of *Osmia bicornis*. The species just mentioned is from 4½ to 5¼ lines in length, and of a black colour, excepting the abdomen, which is red, and has a transverse white spot on each side of the fourth, fifth, and sixth segments—such is the colouring of the female; the male has the body black, with a white spot on each side of the second, third, fourth, and fifth segments.

A second species of this genus, the *S. clavicornis*, is also found in England. Both sexes are black, and have interrupted yellow bands on the abdomen.

The genus *Thynnus*, according to Latreille, also belongs to the present family, and the species are readily distinguished by the antennæ being filiform, and the eyes entire, *i.e.* not emarginate, as in *Sapyga*.

Polochrum.—This genus, like *Thynnus*, has the antennæ filiform, but the eyes are emarginate, as in *Sapyga*; the mandibles are tridentate.

SARACENA'RIA. [Foraminifera, vol. x., p. 348.]

SARACENS, a name improperly given by the Christian authors of the middle ages to the Mohammedans who invaded France and settled in Sicily. Concerning the etymology of this word there have been various opinions. Du Cange (*Glossarium*, v. 'Saraceni') derives it from 'Sarah' the wife of Abraham; Hottinger (*Bib. Or.*) from the Arabic word *saraca*, which means 'to steal, to plunder.' Forster, in his 'Journey from Bengal to England,' derives it from *sahra*, 'a desert.' But the true derivation of that word is *sharkeyn*, which means in Arabic 'the eastern people'—first corrupted into Saraceni (Σαρακηνοί) by the Greek, and thence into *Saraceni* by the Latin writers. Stephanus Byzantinus says that 'Saraka is a region of Arabia, adjoining the Nabathæi, and the inhabitants are called 'Saraceni.' Ptolemy (vi. 7) makes Saraka a city of Arabia Felix. The name Saraceni occurs in Pliny (vi. 28), and it seems that it began to be used about the first ce[illegible] applied to the Bedouin Arabs who [illegible] between the Euphrates and the [illegible] and [illegible] Roman possessions in Asia from [illegible] thian kings. The description of the [illegible] Marcellinus (xiv., c. 10) exactly correspon[illegible] of the Bedouins. In course of time it bec[illegible] name of all the Arabian tribes who embrace[illegible] Mohammed, and spread their conquests over [illegible] portion of Asia and Africa. For the history [illegible] ple see the articles Arabs, Moors, &c.

SARAGOSSA, by the Spaniards written [illegible] large and wealthy city of Spain, the capital of [illegible] kingdom of Aragon, is situated in a fertile pl[illegible] bank of the Ebro, and at the conflux of the G[illegible] Huerva. The Ebro, which is navigable the [illegible] the year, separates the city from its suburbs. [illegible] bridge six hundred feet in length, and re[illegible] arches, is the only means of communication [illegible] two. There was formerly another bridge bu[illegible] wood, but it was destroyed in a sudden ov[illegible] river. The Gallego, a considerable stre[illegible] a branch of the Pyrenees, traverses the plain in whi[illegible] gossa stands, and falls into the Ebro at a sl[illegible] below the city. Nearly opposite, the Hu[illegible] through a deep cleft, cuts the plain on [illegible] passing close to the walls, likewise join[illegible] is also in the neighbourhood a canal called [illegible] Imperial de Aragon,' which is intended for purpo[illegible] gation, as well as to form a communication b[illegible] sea to sea between Santander in the Bay of [illegible] tosa on the shores of the Mediterranean, a [illegible] than one hundred Spanish leagues. It was begun under Charles V.; but the work, which has been [illegible] and resumed several times, is far from being [illegible] What little is done however spreads wea[illegible] and [illegible] over the neighbouring districts; the p[illegible] of [illegible] which is in a high state of cultivation, bei[illegible] by it. Most of the streets of Saragossa [illegible] crooked; the houses are old, but regularly [illegible] city however has many remarkable buildings. [illegible] or the Exchange, is a fine stone edifice, round [illegible] marble busts of most of the kings of Aragon [illegible] niches; the large hall is the place where the [illegible] assembles. Nearly opposite to the Lonja is *La* [illegible] *Diputacion*, a noble building erected by [illegible] principal hall of which are portraits of the [illegible] It serves for the sittings of the *Audiencia*, [illegible] gistrates. The palace of *La Aljaferia*, formerly [illegible] dence of the kings of Aragon, is a fine square b[illegible] towers at the angles; it was built by Abú Jafar [illegible] billah, whence its present name, which is a [illegible] *Al jaferiyyah*. 'La Casa de la Misericordia,' [illegible] lum, built by Ferdinand V., the last king of [illegible] much admired for its solidity and beaut[illegible] The metropolitan church, called 'La Seu,' [illegible] by its elaborate front and high tower. 'N[illegible] Pilar' is likewise a superb building. [illegible] built entirely of alabaster, in the Gothic [illegible] mired as a piece of antient sculpture. In the [illegible] church, under a high dome, stands the figure [illegible] on a marble pillar, which the people of the pl[illegible] be the same on which she is supposed to have [illegible] pearance to Santiago. Many other monast[illegible] deserving of attention: San Cayetano, [illegible] palace of the Inquisition, and Santa Engra[illegible] however were either entirely destroyed o[illegible] with shot during the two sieges of the city b[illegible] Another singular edifice in Saragossa is the [illegible] (Torre Nueva), which in point of inclination [illegible] does not exceed that of Pisa. It has remained [illegible] inclined position since 1594, the year in which [illegible] Saragossa has eight gates, besides the four old o[illegible] wall of Augustus, part of which may still be trace[illegible] is a university, founded in the year 1474, and atte[illegible] about 1500 students, chiefly natives of the province. [illegible] ciety of Friends of the Country ('Amigos del Pais'), [illegible] tuted about the end of the last century, supports [illegible] of political economy, botany, agriculture, chemistry, [illegible] and mathematics. There is also an academy [illegible] 'Academia de Nobles Artes,' which in former times [illegible] duced some eminent painters and sculptors; and a [illegible] library.

;ossa was formerly called **Salduba** or **Saldyva.** (Plin.,

It was in a flourishing state under the Romans, a emperor Augustus having colonised it with the s of the fourth, sixth, and tenth legions, it was Cæsaraugusta, which word was by the Arabs cor- into *Saracosta*, whence its present name 'Zaragoza,' itten by antient authors, *Caragoça*. In the time of mans, the place gave name to one of the seven atus' of Hispania Citerior (Cæsaraugustanus.) The ınder their king Euric took it about 470. On asion of the Peninsula by the Arabs, it shared the other large cities, and was taken and plundered by on Nosseyr in the year 712. [Musa.] When the of the Beni Umeyyah of Cordova was overthrown bn Hamúd, of the posterity of Idris, the governor of sa, like those of Toledo, Seville, Granada, and other cities of Mohammedan Spain, refused to acknow- he authority of the usurper, and declared himself dent. Saragossa and the whole of Aragon, with a of old Castile and Catalonia, were then erected into a a by Al-mundhir Ibn Yahya Al-tojibí, who not intained himself in it, but transmitted it to his pos- At his death, in 1039, he was succeeded by his son who was shortly after dethroned by Suleymán Ibn -jodhámí, surnamed Abú Ayúb, who held the em- il he died in the year of the Hijra 438 (A.D. 1046-7). succeeded by his son Abú Jafar Ahmed, surnamed tadir-billah, who died in 474 (A.D. 1081-2). The hammedan kings of Aragon were: Abú Amir ı-mutamen-billah, who died in 478 (A.D. 1085-6); far Ahmed, surnamed Al-mustaïn-billah, who was ear Tudela, in battle with the king of Aragon, in). 1109-10); Abdu-l-málik Abú Merwán, surnamed d-daulah (the column of the state), under whose D. 1018) Alfonso I. of Aragon made himself master ;ossa, after a siege of eight months; and lastly, Al-mustanser, surnamed Seyfu-d-daulah (the sword ate), who, after the loss of the capital, maintained in a part of his family dominions until he was killed with the Christians near the town of Albecete, in Jnder the Christians Aragon remained a separate ı, until, by the accession of Charles V. to the throne ı as the representative of the rights of Ferdinand ella, it became a province of the Spanish monarchy. ᵛ.] It preserved nevertheless its own laws and its antient privileges and exemptions, as well as a its liberal institutions, until Philip II., having ffence at the interference of the Aragonese in the is secretary Antonio Perez, marched his army into a, put to death the Justizia and several of the ı inhabitants, and suppressed the liberties of [Perez.]

ossa has gained celebrity by the two sieges which it l during the Peninsular war. When Spain was by French troops, Saragossa was one of the cities ıhabitants resolved to perish rather than submit. h army having invested it in May, 1808, the people ;ossa appointed Palafox their commander, and pre- r the defence. Saragossa being an open city, the had no difficulty to encounter in the approach. ried the post of Torrero, and some other exterior ıough not without great loss, pushed forward their against the gates of El Portillo and El Carmen, ed the city, and forcing their way into it by of Santa Engracia, at length made themselves of nearly half of Saragossa. The French general ed Palafox to surrender in the following laco- ence: 'Head-quarters, Santa Engracia: Capitu- Palafox's answer was equally laconic: 'Head- Saragossa: War to the knife.' A council of war summoned by the Spanish commander, in which esolved to defend the remaining quarters of the by inch, and to retire, in case of defeat, across the o the suburbs, after destroying the bridge. The n being unanimously adopted by the inhabitants, ch were that very night attacked with irresistible he struggle continued for eleven days, almost with- mission, until the French general, convinced that no longer hold his position within the city, raised , with the loss of several thousand men. To obtain n of Saragossa was, on many accounts, an object importance to the French. Accordingly, in November 1808, a large army under Marshals Moncey and Mortier marched to re-commence the siege. Palafox, having imprudently sallied out, was defeated at Tudela, and again under the walls of Saragossa, and the place was invested. The French having speedily carried all the outworks, a furious bombardment began, and almost hourly combats took place, in which the besieged fought with desperate valour. At length, on the 27th January, 1809, a general assault was made, and the French established themselves on the breaches, and thence penetrated into the city, where they met with the most obstinate resistance—old men, women, and children all took part in endeavouring to stop the progress of the enemy. Not only street by street, but house by house and room by room were contended for like the outworks of a fortress, and often taken and retaken. At last an epidemic fever broke out among the besieged, who, after losing nearly a fifth of their numbers, surrendered upon honourable terms. During the second siege of Saragossa, a young woman of the lower classes distinguished herself by her bravery; and her name will descend to posterity as the 'Maid of Saragossa.' Another remarkable instance of the obstinate valour of the people of Saragossa occurred some time ago:—On the 2nd March, 1838, Cabañero, one of Don Carlos's generals, succeeded in penetrating at night into the city, and taking possession of the principal posts. The people however were not disheartened. Without chiefs, and badly armed, they fell upon the assailants, made 2000 prisoners, and expelled the remainder from their walls. A detailed history of the two sieges of Saragossa by the French was published by Ibieca, under the title 'Historia de los dos Sitios de Zaragoza,' Burgos, 1830-1, 3 vols. 8vo.

Saragossa is now the capital of the province of that name. It is also the see of an archbishop. The population is estimated at 50,000. It is 175 miles east-north-east of Madrid, in 38° 14′ N. lat. and 1° 42′ W. long.

SARAISK. [Riasan.]

SARATO'GA SPRINGS, an incorporated village in the state of New York and county of Saratoga, North America, is situated on the west bank of the Hudson, in 43° 4′ N. lat. and 73° 40′ W. long., 163 miles north from New York, 30 miles north from Albany, and 16 miles south from Glens Falls, all direct distances. This village derives its celebrity from its mineral springs; it is indeed the great watering-place of the United States, as many as 1500 persons having been known to arrive in a week. It consists of one handsome broad street bordered with trees, in which there are many hotels, four or five of them, especially the Congress Hall hotel, being of the largest and most splendid description, and occupied in the summer and autumn by some of the richest and most distinguished persons in America. The settled population in 1830 was 2461. Saratoga Springs is connected with Albany by two railroads, the Mohawk and Hudson railroad, which extends from Albany to Schenectady, 16 miles, and the Saratoga and Schenectady railroad, which extends from Schenectady to Saratoga Springs, 21½ miles. Ballston Spa, seven miles south-west from Saratoga Springs, is another village frequented for its mineral waters. The environs of both places consist of nothing but plains and hills of sand, producing a scanty crop between dark pine-trees. There are fourteen springs at Saratoga Springs, and four at Ballston Spa. The temperature is nearly uniform, varying from 48° to 52° Fahrenheit, and the quantity of water is not perceptibly altered by the difference of seasons. The waters are purgative and stimulant, and are chiefly useful in dyspepsia, chronic rheumatism, and diseases of the skin. The Congress Spring is the one most resorted to, a gallon of the water of which contains, according to the analysis of Dr. Steel, the following ingredients:—

	Grains.
Muriate of soda* . .	471·5
Carbonate of soda . .	16·5
Carbonate of lime . .	178·476
Carbonate of magnesia .	3·356
Carbonate of iron . .	6·168

——— 76 grains,

and 343 cubic inches of carbonic acid gas, an exceedingly large quantity, perhaps greater than is contained in any other spring yet discovered.

(*Encyclopædia Americana;* Stuart's *Three Years in*

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* This is common salt, which was formerly supposed to be a compound of muriatic acid and soda, and therefore called *muriate of soda*: but has since been found to be a compound of chlorine and the metal sodium; its proper chemical name is therefore *chloride of sodium*.

North America; Arfwedson's *United States and Canada in* 1832-3-4; and as to the convention of Saratoga, BURGOYNE.]

SARATOW, a government of Asiatic Russia, lies between 48° and 53° N. lat., and 42° 20′ and 50° 20′ E. long. It is bounded on the north by Pensa, Simbirsk, and Orenburg, on the east and south by Astrakhan, and on the west by Tambow, Voronesh, and the country of the Don Cossacks. The northern frontier is 375 miles in extent, but the southern only 75 miles. The area, according to Schubert, is 90,000 square miles; but Koppen, who is probably correct, makes it 73,000, and the population 1,564,000. The soil of this government is very unequal: to the east of the Volga, which traverses it from north to south, and divides it into two nearly equal portions, it forms an immense steppe, destitute of wood and fresh water, and everywhere exposed to the winds; on the west of the Volga the surface is undulating and varied with hills, very fruitful in the northern part, but poor and stony towards the south. The steppe is flat, except towards the north, where the last branches of the Obchtchei Syrt, a range of sand-hills, extend to the Volga. In the western portion there are hills of slate and limestone, which are pretty elevated in the south, and accompany the right bank of the Volga as far as Zaritzyn. These hills separate the Volga from the Don, which approaches it near Zaritzyn, and seem to form an invincible obstacle to the junction of those two rivers, which was contemplated by Peter the Great. The Volga traverses the government in its whole length from north to south, as far as Sarepta below Zaritzyn, where it forms an elbow, and, running to the east, divides this government from that of Astrakhan. It receives some small streams, both on the east and west. To the west of the Volga there are some tributaries of the Don, which run from south to north. In the eastern part there are many lakes, the most remarkable of which is the salt-lake of Elton, on the south-east, towards the frontier of Astrakhan. 'The appearance of this lake,' says Erdmann, 'is very singular: in the hottest season you fancy that you have before you a sea covered with ice and snow; so great is the illusion produced by the crystallized salt along the banks and over the whole surface.' On the north side the banks rise rapidly; on the south access to it is easy. The lake is of an oval form, the longest diameter being about 11 miles and the shortest nearly 9 miles. The superficial extent is 45,500 English acres. It yields annually 10 million poods (360 million pounds), producing, when refined, at least 100,000 tons of pure salt, in collecting which 10,000 workmen are employed. There are some other less considerable salt lakes. The climate is temperate, the air dry and healthy. The mean summer heat is 64°, and the mean winter cold 23°; the greatest cold is −17° and the greatest heat +97° of Fahrenheit's thermometer. Violent whirlwinds are frequent. The steppe beyond the Volga serves only for pasturage, and it is only along the banks that we meet with a little cultivation. To the west of the Volga, on the contrary, agriculture is the chief occupation of the inhabitants; and in the north-west part the soil is so rich as to need no manure. A harvest which does not yield five-fold is considered to be a bad one. The kind of grain most cultivated is rye; then wheat and oats, as well as millet and peas, flax and hemp. The foreign colonists have introduced the cultivation of tobacco, hops, and madder. The inhabitants cultivate melons (especially water-melons), fruit-trees, and even vines about Sarepta, and mulberry-trees at Saratow. The forests, which are chiefly to the north-west, consist of oaks, pines, maples, and poplars, but though pretty extensive, they do not suffice for the general consumption. The breeding of cattle is, next to agriculture, the chief occupation of the inhabitants; the breed of sheep, which yield coarse wool, has been improved by the importation of merinos. The Tartars keep a great quantity of bees. Game is still abundant in the north-west parts. The fisheries on the Volga not only supply the home consumption, but furnish a large surplus for exportation. The minerals are salt, millstones, and a little iron.

The population of this government is composed of Russians, Tartars, Cossacks, and other tribes, besides a great number of foreign colonists. At the accession of Catherine II., the population was extremely scanty, and that sovereign, wishing to introduce agriculture and civilization, turned her thoughts to the means of accomplishing this object. As no Russian province was sufficiently peopled to spare any part of its inhabitants, the empress invited foreign colonists to
settle in lands on the banks of the Volga, wh
to them with very great privileges. Many
mans came to Saratow, where they were
French and Swedish families; the whole numb
10,000. They were received at first in 16
near the town, and afterwards houses were
on the land assigned to them; the empress pre
with the utensils, flocks, draught-cattle, and
and provisions for their subsistence for a considera
she also exempted them for ten years from all taxe
they soon prospered, and gradually founded 104
some of which are on the left bank of the Volga,
river, or at the mouth of its tributaries. Most of th
ever are on the right bank between Volgsk and
schinst, and on the banks of the Medweditza and
Ilawlia, which fall into the Don. The names of S
Schaffhausen, Zürich, Glaris, Lucerne, Unterwa
which are given to these villages, indicate the orig
try of the founders. Seventy-three of these
Protestant churches; in most of the others t
fess the Roman Catholic religion. The
Sarepta was founded by the Moravian brethren,
still its only inhabitants.

In the year 1836 the population of these colonies
to 109,795, and it appears to be rapidly increa
that same year there were 6330 births, and only 2
Yet still the government is very thinly peopled,
only 21½ inhabitants to a square mile. The
therefore resolved, by a decree issued in Mar
(1841), to remove from the crown lands in the b
governments many thousand peasants to those
Orenburg, and Ekatarinoslaf, many of whom will do
regret leaving their homes, but will be indemnified
superior advantages they will find in their new coun

SARATOW, the capital, is situated on the right
the Volga, in 51° 31′ N. lat. and 46° E. long., in an
barren valley, between the river and a range of pr
calcareous mountains. The town, which is neith
some nor regular, is divided into the upper and lower
it was built on its present site in 1665, and has be
quently ravaged by fire. In the year 1811, 1700
were reduced to ashes. The greater part of the city
of wood, there being at present only 360 houses of s
brick, and 2874 of wood. Some of the former a
handsome, and there are 7 stone and several
churches, 2 convents, and a very large market-p
bazaar. There is likewise a gymnasium and a
garden. Saratow is the seat of a consistory for th
testant communities (except the Moravians at Sa
the governments of Saratow, Astrakhan, Voronesh,
bow, Riäsan, Pensa, Simbirsk, Kasan, Orenburg, and
amounting to above 600,000 souls, most of whom are
colonists. The inhabitants were officially stated to be
males and 20,794 females. The increasing population
colonies has had an influence on that of the chief tow
is the centre of a very extensive and advantageou
Volgsk, with 8500 inhabitants, is a very pretty tow
at the foot of a high mountain on the right bank of the
about 90 miles above Saratow: it is inhabited by
merchants, who carry on a considerable trade. Th
town of Sarepta was founded in 1765. All the
which are planted with poplars, terminate in a ver
market-place, with a fountain in the centre, which
every house with water. The Moravians intended
to follow agriculture, but in the midst of an arid ste
could not execute this project; they now have manu
of linen, cloth, tobacco, liqueurs, &c., with which the
on considerable trade with the Calmuks. Amo
public buildings there are three deserving of noti
the Asylum of the Sisters, in which all the u
women reside; 2, the Asylum of the Brethren, fo
unmarried young men; and 3, that for widows:
first two there are schools. The gardens round
are cultivated with extreme care.

(Stein; Cannabich; Hörschelmann; Schnitzler.)

SARCOCELE (from σάρξ, flesh, and κήλη, a tu
the name of a disease by which the testicle becomes
from its natural structure and converted into a har
like substance. The term however is of such gene
port, that there are few diseases of the testicle whi
not be included under it; accordingly the older
called all indurations and enlargements of this orga
celes, whether they were of a benign or of a ma

In modern phraseology the term is restricted to
chronic enlargements and indurations of the body
estis, of a perfectly benignant character, but incon-
on account of their size and weight. These swell-
y continue for years without undergoing any visible
or a sudden increase in their bulk may arise, and
icle be converted into a painful, ulcerated, and in-
mass of disease. Sarcocele may be distinguished
drocele, the disease which most nearly resembles it,
ardness, weight, and want of transparency; but oc-
ly the two diseases are met with together, and this
nd affection is called hydrosarcocele. With respect
reatment of sarcocele, various and rather opposite
s have at times proved successful. When the en-
nt is accompanied by pain or any degree of inflam-
leeches, hot fomentations, and poultices applied
lly, with the administration of an emetic, and the
of a general antiphlogistic regimen, would seem to
ated. When the disease is altogether chronic, sti-
g lotions, liniments, or ointments may be applied to
elling. In either case, the use of a suspensory
or bag truss for the support of the part should not
ected. If these means fail in arresting the progress
lisease, extirpation of the gland must be had re-
o.

COÏDEA, a group of Polypiaria, of which the type
ld Linnæan genus Alcyonium.

general view of the structures of invertebral ani-
e perceive in regard to their dermal system variations
h importance, coincident with the habits of life to
he individuals are destined. Among the acephalous
a, for example, it is a beautiful subject of investigation
nine into the use of the shelly valves which open and
respiration and motion in the Cardiaceæ, which open
iration only in the oyster, and which are not required
at all in the same sense in the Pholadariæ. Com-
with these last the Tunicata, we pass gradually down
Ascidioid Polypiaria, and thus become familiarised
e ciliary movements and aquiferous tubes of the
t groups of polypi.

elation of the hard parts associated with the retractile
ce of polypi to the way of life of these animals, is
y in reality quite as close and important as among the
a, but it is not so obvious. In the stony radiated plate
gia, the stony internal ramose axis of Corallium, the
ny and half-horny axis of Isis, the wholly horny
Antipathes, and the fibrous skeletons of Alcyonium
ongia, we see in general terms the use of these parts
orts ('fulcra') to the more active and animated
ffording the requisite attachments, and permitting
umption of suitable general shapes. Though insu-
some degree from the soft animal parts, they are
not to be viewed as merely inorganic or even extra-
r parts, any more than the wood of a dicotyledonous
hich no longer serves to convey in a healthy condi-
fluids which are circulated through it.

e considerations give more importance to the classi-
s of Polypiaria from the stony, horny, fleshy, or
ous character of their mass, than might at first sight
In the Sarcoid (or sarcinoid, or carnose) Polypi-
may imagine the *distinct collected* axis of Corallium
atula to be *ramified* and reticulated, and so involved
) in the more active gelatinous mass, as to lose its
ive character; we have then the alcyonium. One
rther, let this expanded reticulation of fibres acquire
hat more of rigidity, and the gelatinous mass, still
with it, become apolypiferous (as a plant may be
ed to become flowerless), and we have the sponge,
the last, and yet not really doubtful term in the
ling series of radiated invertebral life.

ouroux employs the title Polypiaria Sarcoïdea for
his three great divisions of Polypiaria (1821). The
ement stands thus:—

1. Supports flexible or not entirely stony.
2. „ entirely stony, and not flexible.
3. „ fleshy, more or less irritable, and without central axis.

division includes three orders, viz.:—

onicæ, in which are eight genera, viz. Alcyonium,
ria, Ammothea, Xenia, Anthelia, Alcyonidia, Alcy-
Hallirrhoë.

cliniæ (belonging to Junicata).

nariæ, in which are seven genera, viz. Chenendopora, Hypalimus, Lymnoria, Pelagia, Montlivaltia, Isaura, Ierea. (These are fossil groups.)

This system is mainly based on the previous labours of Lamarck (1816), who placed Alcyonium in his group of Polypiers empatés, but gave, after Savigny (to whom we owe most of our knowledge of these animals), in his group of Polypiers tubifères, the genera Anthelia, Xenia, Ammothea, Lobularia.

Blainville (1834) includes in his *Sarcinoïdea*, the fourth family of Zoophytaria, the Alcyonoid types of organization, and notices eleven genera, viz. Briareum, Lobularia, Ammothea, Xenia, Nepthya, Anthelia, Alcyonium, Cydonium, Pulmonellum, Massarium, Cliona; but remarks that several of them are of small importance.

In Dr. Johnston's very commendable arrangement (*British Zoophytes*, p. 75, 76, 1838) the Alcyonidæ form a family of Asteroid Polypiaria.

From Blainville we take the following characters of the family and the genera:—

Family, Sarcoïdea or Sarcinoïdea.

Animals polypiform, with (mostly) eight pinnated tentacula, more or less immersed, and scattered on the surface of a common polymorphous, irregular, fleshy, adherent mass; the *mass* is composed of one (suberiform) substance, and supported by (calcareous) aciculæ. (The animals much resemble those of Pennatula.)

N.B. All the genera have eight pinnated tentacula, except when the contrary is mentioned.

Genus Briareum, *Blainville*.

Animals thick, issuing from prominences irregularly scattered on the *polyparium*, which is widely attached, subramose, externally composed of a fleshy thick distinct *envelope*, internally composed of an assemblage of closely fasciculated aciculæ.

Example.—Briareum gorgonoideum. (Gorgonia Briareus, Linn., Gmel.) Sol. and Ellis, tab. 14, figs. 1 and 2.

Genus Lobularia.

Animals entirely *retractile* into suboctangular cells, which are scattered on the mass, but are especially more numerous on the digitated extremities thereof: *mass* more or less pedicellated and widely attache.

Example.—Lobularia digitata. (Alcyonium manus diaboli.) Common on the English coasts. Dr. Johnston retains for this group the name Alcyonium.

Genus Ammothea, *Savigny*.

Animals rather short, *not retractile*, scattered, and numerous on the whole surface of the short crowded divisions of a common plant-like attached *mass*. (The nonretractility of the Polypi is the main character.)

Example.—Ammothea virescens. Red Sea.

Genus Xenia, *Savigny*.

Pinnules of the tentacula in *several rows*; tentacula not retractile at the base: *animals* collected at the extremities of short-lobed ramifications from a membranaceous base.

Example.—Xenia umbellata, *Savigny*. Red Sea.

Genus Nepthya, *Savigny*.

Animals not retractile, prominent on the surface of many hook-formed spiculiferous lobes, supported on pedicles from a common enlarged base of attachment.

Example.—Nepthya Savignii. (Blainville's 'Actinologie,' pl. 88, fig. 6.) Egypt.

Genus Anthelia.

Animals half-retractile and prominent on (herissant) the surface of a *crustiform* attached *mass*.

Example.—Anthelia glauca, Savigny. Red Sea.

Genus Alcyonium, *Fleming*. (Adopted by Blainville.)

Circle of tentacula complete: fleshy bases arborescent, investing or adnate, and regularly covered with polypiferous papillæ.

According to Lamouroux and Fleming, Alcyonium gelatinosum (Alcyonidium, *Lam.*) has 12, A. hirsutum 18 to 20, and A. echinatum 12 *simple tentacula*. They cannot therefore even belong to this family. The old genus Alcyonium is in fact lost in the modern divisions, or applied to forms and structures materially different.

Genus Cydonium, *Jameson*.

Animals with an orifice at the base of each of the tentacula, and retractile into stelliform cells scattered in the surface of the *mass*, which is externally coriaceous, internally fleshy, and contains numerous stiff spiculæ perpendicular to the surface.

Example.—Cydonium Mulleri; Alcyonium cydonium. (Müller, *Zool. Dan.*, tab. 81, figs. 3, 4, 5.) North Sea.

Genus Pulmonellum, *Blainville.*

Animals fusiform, with *six simple tentacula* immersed in six dentate cells, on the surface of a spheroidal lobed adherent *mass*, which is composed of a fleshy substance and spiculæ.

Example.—Pulmonellum ficus. Ellis, 'Corall.,' tab. 17, f. b, B, C, D.

(Ehrenberg properly doubts the propriety of this being retained in the family at all.)

Genus Massarium, *Blainville* (part of Sympodium, *Ehrenberg*.)

Animals contained in five-rayed cells, on the surface of an amorphous spongoid mass. (According to Ehrenberg the polypi are really octotentaculate.)

Example.—Massarium massa. (Müller's *Zoologia Danica*, pl. 81, figs. 1, 2.) North Sea.

Genus Cliona, *Grant.*

Animals cylindric, slender, transparent, with 8 *simple* tentacula, contained in papilloso-tubular cells; *mass* fleshy, spiculiferous, anastomosed.

Example.—Cliona celata, Grant. English Channel and North Sea.

On reviewing this series of genera it is very apparent that the group is not by any means completely defined or satisfactorily divided. If the tentacula may be pinnated, or simple, and from 6 to 20 in number, and the substance transparent or coriaceous, gelatinous, or fibrous, the family is not properly characterized.

Most of the fossil species from the chalk and oolites, often referred to Alcyonoidea, are more probably of the spongoid type—the Amorphozoaria of Blainville.

SARCO'MA is a morbid tumour whose tissue is fleshy and moderately firm. Several species of sarcoma were described by Mr. Abernethy in his 'Classification of Tumours,' such as the common vascular sarcoma, the adipose or fatty kind, the pancreatic, the mammary, &c. Some of these still retain the same names, but in general the term sarcoma has no other meaning in surgical works than the indefinite one already given, and includes all fleshy tumours that are not cancerous, or medullary, or melanotic. [TUMOUR.]

SARCO'PHAGUS (from a Greek word, σαρκοφάγος, which literally signifies *flesh-eater*), the name given to the Egyptian stone coffins. It is not known when this strange term was first applied to them, nor why. These coffins consist of two parts, a case formed of one piece, and open at the top, in which the mummy was to be deposited, and a lid to cover the opening. As these sarcophagi are generally of hard stone, and often extremely hard, the working of them must have been very expensive, and they could only have been made for kings and very rich persons. There are several fine specimens in the British Museum; one, which was brought from Alexandria after the capture of that city from the French, is probably unequalled by any other yet discovered. It was found by the French in the court of a mosque of St. Athanasius at Alexandria, under a small building, where it was a sort of object of adoration to the Mussulmans, who however had drilled two large holes in the bottom of it in order to use it as a reservoir of water or a bath. The material is a sort of breccia, similar to the Italian *breccia verde*, and is composed of rounded fragments of granite and porphyry set in a basis of deep green rock. The porphyry is of the most brilliant and varied colours. Though the stone is excessively hard and difficult to work, more than a hundred square feet of its surface have been sculptured with hieroglyphics of the most delicate workmanship, and so small that sometimes ten or twelve are included in a square inch. The number of hieroglyphic characters is said to exceed 21,700. The sarcophagus is rounded at the head and flat at the feet, the rest of it being like a large box. It is about 10 feet 3 inches long, 4 feet 2 inches wide at the feet, 5 feet 4 inches wide at the head, and 3 feet 9 inches in depth. The thickness, measured across the flat rim on the top, varies from about 9 to 10 inches. It is sculptured both within and without with various figures of men and animals, many of the animal forms being of the most easy and correct outline. Dr. Clarke wrote a dissertation to prove that this sarcophagus was the one in which the embalmed body of Alexander the Great was placed; but from a consideration of the chief facts of his funeral and other circumstances, it is almost demonstrable that the sarcophagus was not made for him, and it is indeed improbable that his body was ever placed in it.

Another very large sarcophagus in the Museum appears to be made of a species of black basalt, or perhaps a breccia. It has some sculptures upon it, which have been called volutes, but to which in reality they have little resemblance. The intaglios upon it are less numerous than on the former, but many of them are of a larger size.

There is one, also in the Museum, which is a specimen of Egyptian workmanship. It is compact black stone. Though it differs very neral form from the other sarcophagi, it is so in fact a mummy-case of stone instead of tured inside so as to give room for the rou body and the projecting part that indicates t probably intended to be placed erect like the ou cases.

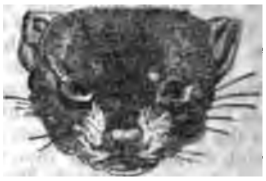
A beautiful sarcophagus of arragonite was Belzoni in the great tomb which he opened at has the appearance of white alabaster, and is when a candle is placed in it. It is sculptured without with figures not more than two inches 9 feet 5 inches long, 3 feet 7 inches wide, an thick. This unique specimen was bought by Soane from Mr. Salt.

The two sarcophagi found in the two g Jizeh are of white granite. There are no sculptured on either of them.

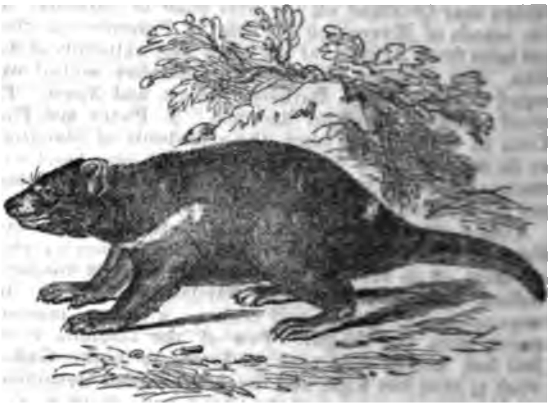
For further information see the *Library of ing Knowledge*, 'Egyptian Antiquities,' fr notice has been abridged.

SARCO'PHILUS, the name by which M. F designates a genus of *Marsupialia*, founded on *ursinus*, Auct., *Didelphys ursina*, Harris, upon characters which, in the opinion of M. F. Cuv tinguish it, and for some of which he acknowl is indebted to Professor Owen, who communi a skull of the animal.

M. F. Cuvier states that *Sarcophilus* approaches nearer to the *Thylacini* than to the *Dasyuri*, but that it is very different from either. These differences are well pointed out in the last part of his 'Histoire Naturelle des Mammifères,' where a very good figure of the animal is given. That by Harris, in 'Linn. Trans.,' from which the cut illustrating the history of the animal, in the article MARSUPIALIA [vol xiv., p. 455], is taken, does not convey a satisfactory idea of the form which we have seen alive in this country, and which is well represented in M. Cuvier's figures, of which the subjoined cuts are copies.



Head of Sarcophilus ursinus. (F. Cuv.)



Sarcophilus ursinus. (F. Cuv.)

SARCORAMPHUS. [CONDOR; VULTURIDÆ.]

SARDANAPA'LUS is the name by which the Greek and Roman writers designate the last king of Assyria. He was a wealthy and powerful king, and is said to have built two towns, Anchiale and Tarsus, in one day. (Steph. Byz., v. Ἀγχιάλη; Suidas, v. Σαρδανάπαλος; comp. Herod., ii. 150.) But he was a man of voluptuous habits, and spent his life in his palace at Ninus or Ninive, surrounded by women. The only event of his life in which he is said to have acted like a man was also the last. The common account of the mode in which he ended his life, at the time when his kingdom fell into the hands of the Medes, is given by Diodorus Siculus (ii. 24-27) and Justin (i. 3). Arbaces, who was his satrap in Media, one day with great difficulty obtained admission to his master, and to his astonishment found him engaged in his usual unmanly occupations among his concubines. Filled with indignation, Arbaces on his eturn declared to his friends that he could no longer obey uch a king. A conspiracy was formed, and Arbaces, with his Medes, joined by Belesys, a Babylonian priest (probably Chaldaean), marched against Ninive (comp. Herod., i. 95). danapalus at first endeavoured to conceal himself; according to others, he marched out to meet the rebels, and was successful in three battles; and then, thinking himself afe, he gave himself up to his usual pleasures, and prepared grand feast for his army. Arbaces however in the mean ti surprised the king's camp, routed the enemy, and ove the king with a few followers back to his capital. here Sardanapalus maintained himself for two years, though eserted by all the provinces, and when at last he saw that urther resistance was useless, he caused a pyre to be raised n which he burnt himself with all his treasures and his women. Assyria thus fell into the hands of the Medes, who united it with Media. The time of this event is uncertain; some suppose that it took place about 880, some again place it in the year 717, and others in 606 B.C. The name of King Sardanapalus, both in antient and in modern times, has been used proverbially to express the highest degree of voluptuousness and effeminacy.

SARDEGNA, SARDINIA, a large island in the Mediterranean Sea, situated between 38° 52′ and 41° 17′ N. lat. om Cape Spartivento, the most southern point, to Cape ongosardo on the north, and between 8° 4′ and 9° 50′ E. long. om Cape Caccia near Alghero, the most western point, to ape Comino on the eastern coast. Its form is a parallelogram 140 nautical miles in length, with an average breadth f 60 miles, leaving out the projections. The area is a trifle arger than that of Sicily, according to the admeasurement f Captain Smyth, and so it was considered by Scylax, who places Sardinia before Sicily in point of size. (Cluverius, *rdinia Antiqua*.) The eastern shore of Sardinia faces the oasts of Rome and Naples, the north-eastern point of the land, near Terranova, being about 150 miles west by south f the mouths of the Tiber, and Cape Carbónaro, at the outh-eastern extremity, being about 300 miles west of the oast of Calabria. Cape Spartivento, the most southern oint of Sardinia, is about 120 miles north of Cape Serrat n the coast of Tunis; and Cape Carbonaro, the south-east oint, is 170 miles from Trapani on the north-west coast of icily. Towards the north, the narrowest part of the Straits f Bonifacio, which divide Sardinia from Corsica, is about ine miles across; to the westward, Port Mahon in the land of Minorca is about 200 miles distant from Cape nnu near Oristano on the west coast of Sardinia; and e islands of Hyeres on the coast of Provence are about 30 miles from Asinara at the north-west extremity of Sarnia. The situation of Sardinia is therefore central with gard to Italy, Sicily, Barbary, France, and Spain. The land contains excellent harbours; S. Pietro and Porto onte on the western coast, the roadsteads of Maddalena n the northern and Terranova on the eastern, besides the cious bays of Cagliari, Palmas, Oristano, and Alghero, nd the roadsteads of Vignola, Tortoli, and Porto Torres.

A chain of primitive mountains runs from north to south ong the whole eastern side of the island, occupying about -third of its surface, and forming the wild districts of llura, Ogliastra, Barbargia, Sarabus, and Budui: this ange consists of granite and schistus, with large masses of uartz, mica, and felspar. Few of the summits exceed 000 feet, except the peak of Limbarra in the Gallura, which is 3686 feet high, and the group called Genargentu, which is near the centre of the island, and attains an elevaion of 5276 feet. West of this highland region, and along he central length of the island, there is a succession of fine plains intersected by ranges of smaller hills, and stretching in some places as far as the western coast, such as at Oristano and Alghero. The remaining part of the western coast is occupied by several unconnected mountain-groups, some primitive, some secondary, and others of volcanic formation, jutting out in numerous and picturesque headlands, and giving to that part of the island a more varied and pleasing aspect than the abrupt and iron-bound eastern coast. At the south-western extremity of the island are the mountains of Sulcis, consisting of granite and primitive limestone, separated from the eastern chain by the Campidano, or wide plain which spreads north of Cagliari towards Oristano. North of the Sulcis, and separated from it by the romantic valley of Iglesias, are the mountains of Murgiani and Arcuentu, which rise along the western coast, and the latter of which attains the height of 2315 feet. North of these lies the deep gulf of Oristano, and east of it is a great plain, through which flows the Tirsi, the principal river of Sardinia. North of this plain, and near the western coast, is the group of Monte Ferru, which rises 2796 feet about the sea; and farther north towards Alghero is Monte Minerva, 2400 feet high. A succession of highlands, partly of volcanic formation, extends north of the basin of the Tirsi, and quite across the breadth of the island, through the district of Goceano, and joins the mountains of Gallura on the eastern coast. This range divides the north-west part of the island from the remainder. At the northern base of it is the extensive plain called Campo d'Ozieri, and Campo di Giavesu, through which the river Coguinas flows to the northward. This plain is bounded on the north-west by a hilly tract, mostly of volcanic formation, one point of which, whereupon stands the town of Osilo, is 2000 feet high. West of this hilly tract is the plain of Sassari, extending from the northern coast at Porto Torres to the western sea towards Alghero.

North-west of the plain of Sassari is the mountainous peninsula of Nurra, which stretches out into the sea, terminating in three abrupt headlands, Cape Caccia to the south, above 500 feet high, Cape Argentaro to the west, and Cape Falcon, the Gorditanum Promontorium of Ptolemy, to the north. A narrow and shallow strait, lined with sharp rocks, runs between this cape and the island of Asinara, the ancient 'Herculis Insula,' a mountainous island of a long irregular shape, indented by several gulfs and coves, and having nearly thirty miles of coast-line to a comparatively small surface. It is inhabited by a few shepherds and farmers. The north and west coasts of Asinara are very steep, Mont Scommunica, the principal elevation, being 1500 feet above the sea. The whole peninsula of Nurra is covered with mountains, the northern parts of which consist of great masses of granite with schistose rocks, and the southern part is compact limestone with gypsum and quartz. The principal summits in this range are from 1400 to 2000 feet high.

A volcanic district, as to which however there is no historical record of its having been in a state of activity, extends along the centre of the island, beginning at Monastir, north of Cagliari, and running northward between Nurri and Sardara: it comprehends the towns of Ales, Milis, and San Lussurgiu, which last is built in the crater of an extinct volcano. It then extends to Bonorva and Queremula, on the border of the great northern plain of Giavesu, where a crater is clearly distinguishable, which from its unbroken conical shape and fine red ashes bears the appearance of comparatively recent action; and the whole surrounding country consists of slaggy lava, rugged scoriæ, obsidian, and indurated pozzolana, with large hills of porphyritic tufa towards Bonorva, lying over calcareous rocks. The volcanic beds extend farther north, through Codrongianus and Osilo in the hilly region east of Sassari, where remains of craters occur, to Castel Sardo, on the northern coast, where they form abrupt cliffs 300 feet above the sea. The town-wall and most of the houses of Cassel Sardo are built of lava. The river Coguinas forms on this side the geological boundary between the primitive formations of the eastern country, and the trap and volcanic products to the westward. At Nurri, in the southern part of the island, on the borders of the eastern highlands overlooking the Campidano, or great plain of Cagliari, are two hills called 'pizz' e ogheddu' and 'pizz' e ogu mannu,' meaning peaks of the little and great eye, which appear to have been ignivomous mouths. A volcanic stream has run from them over a calcareous tract, which forms an elevated plain or table-land nearly 1600 feet above the sea, called Sa giara a Serri, from the neighbouring village of Serri. This plain is covered with oak, ilex, and cork trees, while its northern declivity contains rich pasture. North-west of this plain is the 'Giara,' or lava bed of Gestori, of similar formation, which has proceeded from a crater near the town of Ales: it is strewed with masses of obsidian and trachytic and cellular lava, so as to resemble a city in ruins. At Monastir, in the plain north of Cagliari, there is a distinct double crater now well wooded, and a new bridge has been of late years constructed there of fine red trap, which, with the bold outline of the neighbourhood, renders the entrance to the village by the new road very picturesque. (Captain Smyth's *Sketch of the present State of Sardinia*, 1828.)

The principal rivers of Sardinia are—1, the Tirsi, the Thyrsus of Ptolemy, which drains the central part of the island: it rises near Buduso on the west side of the Gallura mountains, flows first south and then south-west, along the base of the Goceano ridge, passes through the fine valley of Ottana, receiving several tributary streams from the mountains of Genargentu, and then flowing by Fordongianus, enters the plain of Oristano, passing north of that town, and then turning abruptly to the south enters the sea after a tortuous course of between 70 and 80 miles. In very dry summers it is fordable near its mouth, but in winter it contains a vast mass of water, and inundates considerable tracts. 2. The Coguinas, in the northern part of the island, rises in the volcanic region of Bonorva, flows northwards through the plains of Giavesu and Ozieri, receives several streams from the highlands of Goceano and of Gallura, passes between Mount Sassu and the Limbara ridge, when it assumes the name of Rio di Partidas, and flowing through a romantic ravine below the cliffs of Castel Doria, enters a fine plain adjoining the sea: it forms a small lake near its mouth, a few miles east of Castel Sardo. The course of the Coguinas is between 50 and 60 miles, and it is fordable near its mouth, except in rainy seasons. 3. The Flumendoso, the Sœprus of Ptolemy, the principal stream of the eastern part of the island, rises in the mountains of Corno di Bue and runs southwards along a high valley between the ridge of Genargentu on the west and the Ogliastra mountains to the east, passing through many solitary glens: it then turns eastward between the mountains of Sarrabus on one side and the hills of Parte Olla, which divide it from the Campidano or plain of Cagliari, and afterwards winding through the fertile grounds of Villa Puzzu, San Vito, and Muravera enters the sea between two low rocky points on which stand the towers of Xalinas and Corallo, after a course of between 50 and 60 miles. As it runs between two mountain-ridges, the basin of the Flumendoso is very narrow; in the winter it is swelled with the drainage of the surrounding mountain-region, and it then assumes a very imposing appearance. 4. The Mannu rises in the fountain of the Fig in the table-land of Sarcidanu on the south slope of the Genargentu ridge, and flowing southwards through the plain of the Campidano is joined by the Calarita from the mountains of Gergei on the east and the Sixerris which comes near Iglesias from the west: the united stream enters the lake of Cagliari, which lies west of that city and is six or seven miles long by three or four broad, and communicates with the sea by seven cuts through a narrow strip of sand. This lake is navigated by flat-bottomed boats, and contains abundance of eels, mullets, and other fishes; it is also frequented by flamingos and pelicans, which migrate thither in the winter, probably from the lakes of Bizerta and Tunis on the opposite coast of Barbary. Besides these four rivers there are many smaller streams, such as the Turritano, which flows through the plain of Sassari, and is crossed near its mouth by a substantial Roman bridge in excellent preservation; the Termo, or river of Bosa, on the western coast; the Cedrino, or river of Orosei, which is navigable by boats for about a mile and a quarter inland on the eastern coast; it is an abundant and impetuous stream from its source which is on the eastern slope of the Barbargia mountains.

The climate of Sardinia varies greatly according to the seasons and localities. Along the coast the thermometer ranges, in the course of the year, from 34° to 90°; but it falls at times considerably lower in the highlands. The summits of Genargentu are often capped with snow in the course of the winter. The north-west wind is the healthiest, and the east or south-east the most noxious. Hail and thunder-storms are rare, but rain falls copiously in the autumn. In the summer the e[illegible] droughts, but the heavy dews of [illegible] sate for the want of rain. Ear[illegible] slight. The plains and some [illegible] dinia have been notoriously unhealthy [illegible] of the Romans. Cicero, Strabo, Martial, [illegible] Dante, all speak in strong terms of the i[illegible] dinia. The malaria of Sardinia is [illegible] by the [illegible] temperie,' and it appears to be [illegible] malaria of Italy; it does not always [illegible] and sallow skins, but it acts more [illegible] malaria, especially upon strangers, [illegible] of persons carried off by it in a day or two. [illegible] fever is caught during day as well as [illegible] whilst the malaria is considered [illegible] during sleep. Exposure to [illegible] dew of the evening are equally [illegible] much as possible going out of doors until [illegible] rise, and they hasten home be[illegible] set, every door and window, and i[illegible] they hold a handkerchief before [illegible] rally agreed that fire is an excellent pr[illegible] intemperie, and the former lords of C[illegible] large fires round the town every [illegible] it. [illegible] remove from the plains to the higher g[illegible] d[illegible] the 24th of June, when the air b[illegible] though it does not become [illegible] which time it continues so to [illegible] heavy rains precipitate the miasma and [illegible] intemperie of Sardinia lasts therefore [illegible] later than the malaria in the Maremme of Italy. [illegible] who are obliged by circumstances to r[illegible] selves well clad in thick woollens to [illegible] against the burning sun. Exertion, exp[illegible] showers, and fatigue of all kinds are [illegible] and a spare but good diet is adopted, [illegible] drinks. In spite of these precautions [illegible] sons die of the intemperie every year. [illegible] attacked by headache and a painful [illegible] region, with alternate fits of heat [illegible] ensues, the accesses of which are extr[illegible]ly [illegible] followed by great debility, which [illegible] who are accustomed to it, and gene[illegible] Exhalations from the marshes and t[illegible] are nearly dry in summer, and [illegible] active causes of the intemperie, th[illegible] not to be the only causes. [ROME, [illegible].] [illegible] marshes, embanking the rivers, and cult[illegible] chie,' or desert tracts which cover about [illegible] surface of the island, the intempe[illegible]

Many Sards are of opinion that [illegible] districts are particularly deleterious [illegible] grounds, on the contrary, is esteemed [illegible] the 'Ficu Moriscu,' or Cactus Opunti[illegible] crease the intemperie, by abstracting [illegible] the earth, without absorbing moisture [illegible] Wherever the oleander flourishes, intemp[illegible] kind may be expected.

The migrations caused by the intemperie, the scarcity of cottages, pastures, and enclosures, and the numerous tracts of uncultivated land, give to the plains of Sardinia an aspect of depopulation, especially in summer. The inhabitants of the plains are viewed by those of the highlands with marked contempt as weak and degenerate.

The lands of Sardinia are divided into feudal and not-feudal. Sardinia is now the only country in western Europe in which the feudal system remains. The feudal lands either belong to the respective nobles, several of whom are of Spanish families and non-resident, who entrust their domains to indolent 'podatarii,' or stewards, or have been sold to private individuals, who still recognise the feudal lord by paying him a trifling fee, and are under some restrictions, such as not planting vineyards or trees without his consent. The lands not feudal belong either to communities or individuals, and can be let or sold, or given away at the will of the owners. A small part of these lands are enclosed and well cultivated, and are called 'Tanche,' but the larger proportion consist of 'Vidazzoni,' that is, lands belonging to communities; they are mostly divided into three parts, each of which is cultivated in its turn, and while under culture is enclosed with a line of hurdles, and the rest, being fallow, is open to the wandering flocks, and is deemed common. The government has of late years issued decrees in favour of enclosures, and trees and hedges have been planted in many places. The leases are short, often for two years only, and the rent is generally paid in kind. In some parts farms are let on the metayer system, as in many parts of France and Italy. One-third of the surface of the island consists of macchie, or waste, consisting of sandy or stony districts, and lakes and marshes; another third is occupied by forests or natural pastures; and the remainder, which is estimated at five millions and a half of starelli (a measure about four-fifths of an acre), consists of corn-fields, vineyards, olive-grounds, orchards, and gardens. About one million of these starelli are allotted for the growth of corn, and if diligently cultivated they would produce enough to support three times the actual number of inhabitants. Wheat, under the present system of agriculture, gives a return of only seven or eight for one, but in some favoured districts the average is from fifteen to twenty. The Sardinian plough resembles the aratrum of the Romans; it is light, and penetrates only two or three inches into the ground, and has no coulter. Most of the garden-grounds are worked with the hoe, the spade and mattock being generally unknown. The corn is left in the fields until it is threshed, which is performed by the treading of mares or colts on an area prepared by paring off the sward and beating the soil with a mallet to the requisite hardness. Windmills are unknown, and water-mills are only found in some places in the Capo di Sopra, or northern part of the island. Winnowing is managed by tossing up the corn into the air, for the wind to blow off the chaff. Corn is generally ground in a corner of the house by means of the 'mola asinaria,' or domestic mill, turned by an ass. There is no regular system of manuring the ground; it is done however sometimes when urgently required. Paring and burning are the common processes. The only artificial fodder for cattle is the 'mischiale,' a mixture of barley, lucerne, basil, and vetches, well known to the antients.

Cattle, sheep, goats, and swine are divided into two classes; the 'manso,' or tame, being those which work or yield milk, wool, &c., are carefully tended and kept in the best pastures; and the 'rude,' which are for slaughter or for breeding, and which are allowed to ramble over hills and wastes almost in a wild state. Each flock or herd bears a particular mark on the ear. All the labour of the field is done by oxen. The breed of horses reared in the tanche, or enclosed grounds, is carefully attended to: horse-races are frequent. For the improvement of the breed there is a government establishment in the plain of Ghilarza, called 'Regia Tanca,' where Arabian and Spanish stallions are kept, and also Swiss bulls and rams. Sardinian horses are in general free from vice, patient of fatigue, and require but moderate food, and the Sards are generally very good horsemen. The very small horse, called 'acchetta,' which was antiently in esteem among the Roman ladies, is an easy-paced lively little animal. The mule is unknown. Oxen are used for drawing the carts, which are of the most primitive kind, like those in many parts of Portugal; the wheels are made of a solid piece of wood, and stuck round the edge with projecting triangular-headed nails, which are the only iron used in the whole machine. The axletree is fixed into the wheels, and turns round with them.

Sardinia is better provided with forests than Sicily; the best timber is in the mountainous districts of Gallura, Barbargia, Goceano, Marghime, and Planargia. On the south-west side of the ridge of Genargentu is an extensive elevated plain, called 'su Sarcidanu,' covered with fine oak, beech, chestnut, and cork trees, and on the Menomeni range, between San Lusaurgiu and Macomer is another elevated plain called 'su littu de St. Antoni,' about nine miles wide and eleven or twelve long, covered with a rich forest. Fine woods are also found in the Giarre de Serri, and on the hills of Trebina and Arcuosa, and they abound with wild hogs and game. Pine-trees are not common except near Terrava. The cork-tree grows very fine and in great quantity in the northern part of the island. Timber is very scarce in the plains, and the want of roads prevents the people from making use of that of the mountain forests. Dwarf mulberry-trees grow in abundance, but their cultivation is little attended to, although the government has repeatedly endeavoured to encourage the rearing of silkworms; and as early as 1788, a book was published at Cagliari, in both Sardinian and Italian, called 'Moriografia Sarda,' in the form of a dialogue, pointing out to the people the advantages of this branch of industry, and explaining the methods to be followed, but it seems to have produced little effect, at least as late as the years 1823-4, when Captain Smyth took his survey of the coasts of the island.

Among fruit-trees, the fig, the vine, the apple, apricot, peach, almond, and prickly pear are the most common. Walnuts and chestnuts are only met with in some places. Oranges, lemons, and citrons are cultivated chiefly in the southern districts of Iglesia and Villa Cidro, and near Sassari, but are not held in great esteem. Date-trees grow on the Campidano, and some of the produce is gathered and sold, but it is not of a good quality.

Vegetables are fine and plentiful; peas and cabbage grow wild in the greatest luxuriance, and the asparagus of the hedges is abundant in the markets in March and April. Celery and tomatas are large and well flavoured. The 'torzo,' a kind of turnip-cabbage, grows to a gigantic size, weighing without the leaves eight or ten pounds. Saffron is cultivated, and is much used in cookery.

The vine is extensively cultivated, both soil and climate being highly favourable to it; and though the process of making wine is still very imperfect, Sardinia produces some excellent wines. 'The 'malvasia,' or malmsey-wine of Quarto, Cagliari, Bosa, and Sorso, the muscat wine of Alghero, the red wine of Alghero and Oristano, and the cananau, natue, and quarnacia of the Campidano are much esteemed. The natives in general make considerable use of wine. More common white wines are made near Sassari and Terralba, and also in the Campidano. About 2000 Catalan pipes of a hundred quartieri (the quartieri being about eleven pints English) are annually exported from Alghero, about 1700 pipes from Ogliastra on the eastern coast, and 500 or 600 from Cagliari.

There are several extensive olive-grounds, but the oil has not yet been largely exported, although this branch of commerce is on the increase. The best olives are those of Sassari. Inferior oil is produced from the Ogliastra, or wild olive, which, with that made from the Lentiscus, serves the peasants for burning.

Corn is the principal article of export, but the government does not allow the exportation unless the average price of wheat in the principal markets is under thirty reals (11*s.* 3*d.*) the starello, each starello being about a bushel and a quarter Winchester measure. A heavy duty is also imposed on the exportation. The importation of foreign wheat is prohibited, if the average price is not above ten reals the starello. The greater part of the wheat raised in Sardinia is of a superior though soft kind called trigue; it will keep good only eighteen or twenty months; it is sowed in November and December, and reaped in June. In seasons of abundant harvest about 400,000 starelli are exported. The barley is inferior in quality as compared with the wheat; about 200,000 starelli is the utmost quantity exported. Indian corn, though it thrives well, is not very extensively grown. One hundred thousand starelli of beans, 200,000 of peas, and 1000 of lentils are also exported annually.

Cheese is a great object of rural economy; it is made chiefly from sheep and goats' milk, and being steeped in brine, it has a salt bitter taste. A great quantity is shipped for Naples, where it is in great demand, being much used when grated to season maccaroni. Little butter is made, as the treatment of cows is not well understood, and fodder is scarce.

Salt is a monopoly of the government, and a profitable branch of the royal revenue, the continental states of the house of Savoy being supplied entirely from Sardinia. Sweden and other states take many cargoes of salt from Sardinia. The salterns, both natural and artificial, are round the gulf of Cagliari, at Oristano, Terranova, and on the northern coast west of Porto Torres. The salterns are worked by convicts sentenced to the galleys, but the excavation of the mounds and the carriage of the salt is a labour forced on the adjacent villagers, for which they receive a small compensation.

Tobacco is also a royal monopoly. This plant, which was introduced in 1714, while the island was subject to the House of Austria, thrives well, especially round Sassari, Alghero, and the adjacent villages. The Zenziglio, a fine sort of snuff, resembles that of Valencia in Spain.

Flax is cultivated in the neighbourhood of Oristano, and most of it is used in the linen manufactories of the country. The finer sort of linen is made at Busachi. Wool is coarse, owing to the flocks being neglected, and it is manufactured into coarse cloth for the peasantry. A better quality of cloth is made of lambs' wool, and also a fine sort of flannel called pannizzu, made in the district of Sulcis. Cotton grows very well in the Campidano, but is not cultivated to any great extent. Madder grows wild, and is only used by the peasants for dyeing their coarse cloth. Some rock mosses are also gathered for dyeing. But the beautiful tincture of a delicate vermillion, mentioned by the antients by the name of tinctura Sardiniaca, is no longer known. Barilla is forbidden to be cultivated, except in certain places, from an opinion that it impoverishes the land. Bullocks' hides, sheep and goat skins, and kid or lamb skins, are exported in great quantities. Leather is imported from Marseille and other places. Among the yearly exports are from four to five thousand fox-skins; 2000 martin skins and 60,000 rabbit or hare skins. The forests abound with stags, daini or small deer, wild boars, and mufioni, or 'murvoni,' a species of large sheep, clothed with hair instead of wool.

The fisheries of Sardinia are very productive, especially the 'tonnare,' or establishments for taking the tunny fish, which are at the Saline on the north coast, at Flumentargiu, Porto Paglia and Porto Scus on the south-west coast, and at Cala Vinagra, in the island of S. Pietro; and Cala Sapone, in that of S. Antioco. The shoal enters the Mediterranean from the Atlantic in the spring, skirts the shores of Spain and France, and then descending along the western coast of Corsica, part of it finds its way eastward through the Straits of Bonifacio, while the rest passes towards the Black Sea round the south end of Sardinia, remaining on the coast of the island from April till July. Most of the tunnies weigh from 100 to 300 pounds, but some of them are above 300. All the parts of the fish are turned to account, and most of them are salted. Captain Smyth gives an account of the expenses and receipt of a tonnara for one season, in which 3680 tunnies were caught. The expenses of the company, which hired the tonnara for 1125*l.*, amounted to 5174*l.* The heaviest item besides the rent is the wear and tear of the nets, which are divided into several compartments called chambers, and made very strong, as the fish is powerful, and struggles hard. Then there is the oil and salt for pickling, the cost of the barrels, the wages of the men, &c. The receipts amounted to 14,690*l.*, leaving a profit of 9516*l.* Most of the tunneries are let to foreigners, who ship off the produce to various ports of the Mediterranean, and a comparatively small proportion is used in the island.

The fishery of anchovies and sardines, which once used to be very productive, is much fallen off. Coral is taken off the west and south coasts, especially off Alghero, between the months of March and October; but this branch of industry is also abandoned by the natives to the Neapolitans and Genoese, who send from 200 to 300 boats annually, and carry off the produce, paying only a small impost, and a small duty for anchorage. Each felucca or boat generally collects coral to the value of about 1500 dollars, at the rate of 6½*d.* per English pound weight. The coral is polished and worked into necklaces, earrings, and other ornaments, at Genoa, Leghorn, Marseille, and Naples. Pearls of an inferior quality are obtained from the pinna nobilis, which abounds in shallow bays, as at Porto Conte and Liscia. The shell measures from 15 to 27 inches in length, and is sought chiefly for the tuft of silky hair, the byssus of the antients, which is attached to it. The filaments are of a glossy brown colour, about eight inches in length, and are easily spun into gloves, stockings, &c.

Sardinia was noted in antient times for its mines, which were worked to a great extent, as is attested by vast excavations and remains of founderies. South-west of Iglesias is Monte d'Oru, which appears to have derived its name from the gold formerly extracted from it; the mountain has been reduced by excavation to a mere shell. There is no doubt that silver was found in considerable quantities, and is even now procured occasionally, but the government it seems neither undertakes to work the mines nor allows private individuals to work them. A vein of pure mercury being discovered near Oristano, the fiscal magistrate seized the place, on the ground that the walls and cisterns of the town would be damaged by following up the vein. Iron and lead ore are found in abundance in many places, as well as copper. The government has however of late years sent mineralogists to explore the island. In the eastern mountains are found porphyry, basalt, alabaster, and marble. Chalcedonies, jaspers, cornelians, sardonyx, turquoises, and rock crystal are found in the districts of Sulcis and other
mountains of the west. Fossil wood is found at [illegible]
Bonorva, lignite at Villapuzzu, Tonara, and [illegible]
hood of Sassari, and inferior coals at Vi [illegible]
Mandas, Chiaramonte, and other places. [illegible]
found in the grottoes of Sorrenti, nitre is pr [illegible]
and Sammugheu, and is carried to Cagliari [illegible]
manufactory of gunpowder. Amianthus an [illegible]
obtained at Ploaghe and Isili. On the Espa [illegible]
there is a grey mixture of carbonate of [illegible]
resembling fullers' earth, which is used [illegible]
washing, and is called terra saponaria. There [illegible]
mineral springs. The principal are those of [illegible]
Cidro, Fordongianus, in the south, and [illegible]
gali, Codrongianus, and Benetutti, in the [illegible]
however unprovided with buildings or any [illegible]
dation for invalids. Vestiges of antient [illegible]
the sulphureous springs of Fordongianus, on [illegible]
of the Tirsi, but they are now quite forsaken.

The population of Sardinia amounted, [illegible]
The island is divided for administrative [illegible]
prefetture, or small provinces: Cagliari, [illegible]
sei, Nuoro, Alghero, Busachi, Ozieri, [illegible]
Sassari. For ecclesiastical purposes it is [illegible]
dioceses: Cagliari, Oristano, Sassari, G [illegible]
sias, Ales, Alghero, Ampuriase Civita [illegible]
Ogliastra, which are subdivided into [illegible]
Sassari, and Oristano are archbishop [illegible]
also three mitred abbots, 93 conv [illegible]
nuns. (Serristori, *Statistica dell' Ita* [illegible]
Few of the convents are possessed of consid [illegible]
in land, the majority being mendicants. [illegible]
monks does not exceed 1500. The Roman [illegible]
only religion of the country, no other is tole [illegible]
natives boast that no heresy ever spread to [illegible]
court of the Inquisition, existing for cent [illegible]
Aragonese and Spanish dynasties, pr [illegible]
this result.

Sardinia is at present administered by a viceroy [illegible]
by the king for three years: he has a salary [illegible]
Every viceroy, on his arrival at [illegible]
oath to preserve inviolate the statu [illegible]
island. Sardinia has a represent [illegible]
'Stamenti,' consisting of the three o [illegible]
manner of other kingdoms during [illegible]
the ecclesiastic stamento, selected [illegible]
archbishop of Cagliari president; [illegible]
consisting of all nobles, with or without [illegible]
sidency of the most antient feudal nob [illegible]
years of age; and the royal stamento, con [illegible] of the [illegible]
sentatives of the towns, under the Ca [illegible]
Each stamento holds its sittings apa [illegible]
and after separately discussing the [illegible]
communicate by deputies. The [illegible]
is convened and holden by and du [illegible]
and can therefore constitute no per [illegible]
royal will. The chief topic of [illegible]
'donativi,' or supplies requested by [illegible]
when the stamenti have not been convened [illegible]
years, there has been repeatedly a loud [illegible]
and at times something like a popular insu [illegible]

The feudal system continues in activity, [illegible]
ably limited by the interference of the cro [illegible]
rights vary according to the terms of the in [illegible]
feudal lord is required, in all cases, to as [illegible]
support them during imprisonment. No [illegible]
civil and criminal prosecutions, just as co [illegible]
the privilege however of delaying their a [illegible]
tion for twenty-six days. The children of [illegible]
there be a 'fide commesso,' or entail, [illegible]
perty goes to the eldest, generally [illegible]
equally among them at the father's de [illegible]
daughters, who, when they have rec [illegible]
no further claim. Besides manorial [illegible]
the lord of Anglona, bears the title [illegible]
being marquises and counts, there is a [illegible]
inferior nobles and knights, who have the [illegible]
rying arms. Like the priests, they pay n [illegible]
lord, but only to the king and to the [illegible]

Vassals in Sardinia are born free, [illegible]
lord and residence at will, but while on a [illegible]
are bound to feudal services and tenures. [illegible]
of eighteen paying annual tribute, [illegible]
besides the usual imposts on the [illegible]

tributions for robberies and arson committed in the district, and for the exemption from the 'roadia,' or one day's personal labour, and from other dominical services. These taxes are levied in addition to the tithes, the royal imposts, alms (asked as a due, and never refused) to mendicant monks, and other demands, which in some places amount to seventy per cent. on the earnings of the vassal.

The Sards were of old a very mixed race, partly of Celtic and Iberian stock, and partly of Greek and Etruscan race, to which a considerable infusion of Carthaginian and afterwards of Roman blood was added. In later times Pisans and Spaniards settled in the towns and lower country, but in the highlands the population has remained comparatively unmixed, and may be considered as the real descendants of the old Sards, who struggled hard against both Carthage and Rome. The Sards are of a middle stature, and well formed, with dark eyes and coarse black hair, though fresh complexions and blue eyes are also seen in the mountains. In the Campidano they are more swarthy than in the north part of the island, and have generally a large mouth and thick lips. They have strong intellectual faculties, though mostly uncultivated, and an enthusiastic attachment to their country and their native district, in consequence of which families seldom remove or disperse. They are kind and hospitable, but are easily offended and excited to revenge. Being accustomed from early age to the use of the gun, they are excellent marksmen, and will lie in ambush for their victim for whole days, until they have an opportunity of shooting him. If the family of the sufferer has influence enough to stir justice into active measures against the offender, the latter flies to the mountains, where he joins others of a similar description, and becomes a robber. Some of these bands however will not molest strangers; they do not call themselves robbers, but assassins. They levy contributions on the villages and shepherds to supply themselves with necessaries. But on the eastern coast, near Terranova, Dorgali, Galtelli, &c., there are real bands of robbers, who both plunder and murder: they are designated by the name 'malviventi.' The government however has of late years done much towards extirpating the robbers; it has abolished in a great measure the privilege of sanctuary; it has forbidden the use of fire-arms, except to the militiamen, the nobles, and other persons duly authorised; it has sent troops against the more obnoxious bands, and hunted and destroyed them. But as long as revenge is considered by all classes as a moral and hereditary obligation, outlaws will take shelter in the impracticable recesses of the mountains, where it is extremely difficult for the police and the military to discover and arrest them.

Italian is the language of the government, and is also spoken by all educated persons in the large towns. The native tongue, which varies according to districts, is a dialect of the old Romance [ROMANCE LANGUAGE], and is evidently derived from the Latin, with an admixture of words of Greek and Arabic origin. The natives of the Barbargia district pride themselves on the number of Greek words which they retain, and their distinct but harsh and guttural enunciation, which is with difficulty attained by the rest of the Sards.

The language is considered to be purest in the Goceano and in the western district of Marghine, north of Oristano, but it is most elegantly spoken in the Sulcis. At Alghero the Catalonian is generally spoken, the inhabitants being in great measure the descendants of a Catalonian colony, established by Peter the Ceremonious, king of Aragon, in 1355.

The nobles and citizens generally follow the fashions of Italy in their dress, but the country people have peculiar costumes. In the Campidano they wear a jacket or pelisse of undressed sheep or goat skins, with the fleece outside, the 'mastruca' mentioned by Cicero; that which is worn in the Gallura highlands is made of coarse native cloth; in the west, near Bosa, and in the Sulcis, they wear the 'collettu,' or close sleeveless waistcoat of tanned leather, folding on the breast and reaching nearly to the knee. Some 'collettus' are made of yellow or reddish leather from France, decorated with large silver buttons in the Maltese style. The shirt is fastened at the neck by silver buttons, but no cravat is worn. The 'cabbanu,' or heavy dark-brown Maltese cloak, is much worn by the farmers. In Cagliari the men of the lower orders wear a red cap, but in most other parts of the island black caps are worn. The cap or net for hair is also much worn in the southern part of the island. In the highlands of Gallura and Barbargia the men let their hair hang loose over their shoulders, which, with their bushy beards, gives them a ferocious aspect. A kind of black kilt over loose linen drawers, with cloth leggings, completes the dress of the men.

The dress of the females in the towns is an imitation of the Italian fashion; most women wear the Genoese 'mezzaro,' or white veil, thrown over the head and shoulders; those of the upper class wear bonnets. The peasantry adhere to their peculiar costumes. In the northern districts the women wear their sleeves divided in the Greek fashion, and a coarse white net envelops their hair, like that worn by the men. The females of the Sulcis wear a shawl round their heads, and scarlet stockings; at Orosei the women wear a highly ornamented busk projecting from between the breasts, in shape not unlike the prow of a galley, and they have moreover the Oriental custom of covering their mouths. In some places the head is covered with a yellow cloth having a deep red border, as in some parts of the kingdom of Naples; in others with a fine linen tied loosely under the chin. The petticoat is made very full, with small plaits; the shift is buttoned at the neck; the corset is low, over which, on gala days, a rich embroidered jacket is worn, with loose cuffs and silver buttons. Corals, rings, rosaries, and crosses are worn in profusion.

The villages are generally large and well situated, but with unpaved narrow streets, mean houses, and a general want of comfort. Large dunghills disfigure the principal avenues. The villages in the Gallura are built of granite blocks, and in the other northern districts of freestone; but in the southern division of the island most houses in the country are built of sun-dried bricks. The dwellings of the peasants have generally only one story, without windows, or if they have windows, they are not glazed. A whole family often dwells in a single room, with their chickens, dogs, and kids, whilst the patient ass turns the corn-mill in a corner. In the centre of the room there is a square hole in the clay floor for the fire; the smoke finds its way through the door or any accidental crevice. There is generally a large bed in one side of the room for the elders, the sick, or the stranger, for hospitality to travellers is common, and inns are scarce. The younger members of the family do not sleep in a bed till they marry, but they lie down round the fire-place on mats, and frequently in summer in the open air. A few low chairs and a low table constitute the remaining moveables. In the towns there are some tolerable mansions, though comfortless inside, like those of South Italy, and the access is generally dirty. The number of beds indicates the importance of the owner, whose own room contains the saddles, bridles, arms, cordage, and other implements, besides hams and dried sausages, which are hung up, and cabinets filled with walnuts, cheese, pastry, and dried fruit.

Throughout the island the cittadini, or inhabitants of walled towns, hold the contadini, or villagers, in utter contempt, a feeling which is cordially returned by the rustics, besides which the people of Cagliari and those of Sassari mutually hate each other. Kissing on meeting is an indispensable custom among men of all ranks. The hostess welcomes a stranger by a shake of the hand, saying, in a kind tone, 'the stranger is welcome.' Females however never sit at meals with visitors. It is to the honour of the Sardinian women that they are generally moral and dutiful wives, and the baneful custom of the cavalier servente is unknown. The extreme jealousy of the Sards, and their summary mode of avenging an injury, have probably contributed to prevent its introduction. In conversation however the women talk very freely, and laugh heartily at indelicate allusions, as is the case in other southern countries. Among the peasants women are mere servants; they are busily employed about their children and poultry, in manufacturing their linen and 'orbacci' or coarse woollens, and in making bread, and fetching water.

The Sards are fond of feasting; they drink wines and cordials, though rarely to excess, and entertainments on particular occasions are given with a profuse hospitality. Fine wheaten bread is in general use, except among the shepherds of the eastern highlands, who eat a coarse kind of bread, and sometimes acorns. The Sards eat more butcher's meat than the Sicilians or South Italians. Poultry is rather scarce, but game is plentiful. The 'minestra,' or substantial soup, made of pulse, cauliflowers, or herbs, is a national dish, as in Italy; and maccaroni, fideli, and paste of various sorts are manufactured at Cagliari and other places, and are in much request.

The Sards are no great pedestrians: the only mode of travelling for both sexes is on horseback. There are few coaches, and those only in the large towns, and the country people regard them as articles of effeminate luxury. Till lately there were no carriage-roads in the island, but by a royal decree of 1822, a high road of 125 miles in length was ordered to be cut from Cagliari to Sassari through the length of the island, passing by Oristano, and keeping as much as possible along the western plains. It was however necessary to pass the ridge of Menomeni, which runs across the middle of the island, as well as the hills south-east of Sassari, where a fine zigzag road, called 'Scala di Giocche,' has been cut down the face of an abrupt declivity 600 feet high. The whole of the road is now finished, as well as branch roads to the most important towns in the interior. The eastern highlands however still remain difficult of access.

Field sports, such as hunting the boar, stag, or moufflon, as well as sporting for birds, are favourite amusements with the Sards. Their religious festivities and processions, to which they are much attached, afford them also periodical seasons for rejoicing: they are attended with great pomp, and generally end in a feast. Weddings are celebrated with much ceremony and rejoicing. Captain Smyth observed traces of many customs which the Sards have in common with the modern Greeks, in their dances, music, arms, dresses, marriage ceremonies, and superstitions. Some of these peculiarities seem to be derived from the Romans, such as a belief in bad or good omens, the evil eye, a dislike to mention death, and the howlings of the 'accabadore,' a kind of præficæ, who are hired for mourning. The 'accabadora' in the mountainous districts of Barbargia and others used to perform another office, which was to throttle or suffocate dying persons in hopeless cases, in order to shorten the agony; hence the name, which means a 'finisher,' but the practice was abolished in the last century through the remonstrances and exertions of a missionary called Padre Vassello. A belief in witchcraft and dæmoniacal possession is still prevalent, and exorcisms are resorted to as a cure in the latter case.

The laws in force consist of—1, 'La Carta de Logu,' which is a code written in the Sardinian dialect, consisting of 198 chapters, which was published in 1395, by Eleanor 'Giudicessa,' or ruler of Arborea and of the greater part of the island. This charter or code, though tinctured with the barbarity of the times, is remarkable for its equity and wisdom, and being well adapted to the habits and opinions of the Sards, has been adopted all over the island; it remains in force, with few modifications, to the present day. 2, the Royal Pragmatics, a body of laws written in Spanish, and consisting of 51 chapters, which was promulgated by Philip IV. of Spain, in 1633. To it has been added a commentary, by D. Francisco de Vico, regent of the supreme council of Aragon. 3, Capitoli di Corte. These are memorials and petitions laid before the kings of Spain by the national stamenti, with the answers and decisions of the sovereign. To these also has been joined a commentary, by D. Giovanni Dexart, a Sardinian jurist. 4, The royal edicts, and the 'Pregoni,' or ordinances of the viceroys since the island has been under the dominion of the house of Savoy. 5, The new civil code, published in 1830, by the late king Charles Felix. (*Calendario Sardo*, 1831.)

This multiplicity of laws, upon which numerous forms have been grafted, tends to embarrass the course of justice, and gives rise to much litigation and delay. The country judges are very poor, and venality is of common occurrence. Besides this, should a local magistrate prove more than usually active in his office, he is sure to rouse the vengeance of some of the parties, and Sardinian revenge respects no persons, neither magistrates nor priests. The effect of the whole system, especially in the remote districts, is a fearful insecurity of person and property. The superior courts which sit in the towns have a better character for impartiality, but the procedure is very imperfect. In criminal cases the judges in their interrogatories follow the old practice of inducing the accused to criminate himself, by browbeating and endeavouring to entrap him by insidious questions, a method known in Italy by the name of 'interrogatorio suggestivo.' Torture has been abolished in Sardinia, and the horrid tree for mangling and [illegible] which stood on one of the bastions of [illegible] down in 1821, amidst the acclamations [illegible] prits are still sometimes flogged thro[illegible] ass previous to execution. Common [illegible] death are hanged, but nobles and [illegible] Nobles accused of capital crimes are t[illegible] by a jury [illegible] peers.

The law is the chief profession for young men [illegible] able connections, as the whole regular force [illegible] island consists of only one regiment, w[illegible] Piedmont. The liberal arts afford no emplo[illegible] and commerce are considered ignoble. Th[illegible] rank is that of a member of the 'Supremo [illegible] for the affairs of Sardinia, which consists of se[illegible] and sits at Turin. It is a supreme court, and [illegible] upon all important matters, appeals, &c. It [illegible] the projects of law for the island, prop[illegible] ministers. The high court, called Reale [illegible] Cagliari, and is divided into two sectio[illegible] one [illegible] the other for criminal cases. It is [illegible] state for the viceroy, and it pr[illegible] to fill up the vacant bishoprics and the judi[illegible] dical offices. A numerous train of fiscal [illegible] tors, advocates for the poor, assessors, secr[illegible] taries is attached to the court. The Magistr[illegible] Governazione is a high court, which sits at [illegible] and criminal matters relating to the northern [illegible] island. There is an appeal from it to the Real [illegible] Turin. In every town or considerable [illegible] rict there is a magistrate called Vicar, in s[illegible] Consul in others, who, with an assessor and [illegible] in the first instance for the town and surro[illegible] The prefects in each of the eleven provinces [illegible] in civil matters. There is a c[illegible] l co[illegible] called 'Consolato,' which [illegible] sides which the 'Regia Capitania [illegible] miralty court for the island. A court called [illegible] delle Contenzioni,' decides questions which a[illegible] ecclesiastical and lay powers; it consists of [illegible] 'Cancelliere Regio Apostolico,' who is a [illegible] and a secretary. This court was establ[illegible] part of the 14th century, in consequence of [illegible] between the clergy and the sovereign, and [illegible] tioned by several popes.

Sardinia is free from the burthen of the conscription, which has been entailed by the French revolution upon most countries of continental Europe. It furnishes by voluntary enlistment one regiment to the royal army, besides which it has its militia, an irregular force of about 6000 cavalry and 1200 infantry, the officers of which wear a uniform, but receive no pay. The privates have no distinguishing dress except a cockade which they wear on particular occasions; they are armed with a long gun, a knife, and a cutlass, and are expected to patrole the country to arrest malefactors, to repair to any point which might be invaded by an enemy, and to assist the Board of Health in preserving the coasts from contagion. Besides these there is a kind of yeomanry called 'Barancelli,' an armed association for protecting property, especially in the lowlands, against robbers. Every village has its party, under a captain annually selected from among the most respectable inhabitants, and he chooses his men. They maintain a strict watch during the night, from a certain hour in the evening, which varies according to the season, and is made known to the inhabitants by the sound of a bell, after which no one is allowed to be out of doors till the tolling of the morning bell. The barancelli are obliged to make restitution for all thefts. To become a barancello a man must have property to a certain amount, and be well known for his integrity. During the year of his service, and the following year also, he is exempt from royal and baronial service, and has the right of bearing arms. The remuneration of the barancelli arises from every landholder paying an annual sum, the aggregate amount of which, after deducting the losses which may have occurred, is divided among the men at the end of the year. In the year 1819, Count Revel, the viceroy, disliking so many armed men about the country, wished to abolish the barancelli, and supply their place with regular cavalry from Piedmont, called Royal Carabiniers, like the French gendarmes, but as they proved insufficient for want of local knowledge, and the deadly hatred of the peasantry against them, the king was obliged to restore the barancelli under the name of 'Cacciatori Provinciali.' They think it their duty to arrest robbers only, and not persons flying from justice for other causes.

These minute details are given for the purpose of showing the social and domestic condition of the island, which has remained almost unchanged since the middle ages, and which is a curious specimen of the former state of Italy, Spain, Portugal, and other countries of Western Europe.

The regular force in the island consists of about 3000 Piedmontese troops, distributed in the several towns. There are only three regularly fortified towns: Cagliari, Alghero, and Castel Sardo. The coasts are defended by a line of stout towers, garrisoned by a body of coast-guards called Torrari, under the superintendence of a council of three members, chosen for three years, one from each stamento, and are supported by a tax on exports. The naval force of the island consists of one armed brig and two gun-boats called 'corridors.'

Scientific education is given by the two universities of Cagliari and Sassari, each being under the inspection of a council, 'magistrato sopra gli studj,' of which the respective archbishops are presidents. The university of Cagliari is attended by about 250 students, and has the faculties of theology, medicine and surgery, law, and philosophy, with a full list of professors in each. Among the accessories are a library of above 15,000 volumes and a cabinet of natural history and antiquities founded by the late King Charles Felix. The university of Sassari, frequented by about 180 students, has likewise five faculties, but with a smaller number of professors, namely, three for theology, five for law, three for medicine, one for surgery, and five for philosophy and eloquence, or, as it is called, the arts. The accessory establishments consist of a cabinet of natural history, founded in 1823, and a library of only 5000 volumes. An interesting account of the university of Sassari was given in the 'Bollettino di Notizie Statistiche' of Milan for the year 1834. Poor students from the country, while following their course of studies, support themselves by acting as attendants, errand-boys, &c. to wealthy families in the town, and are called 'Majoli.' In the head town of every province there is a 'Scuola di Latinita Inferiore; the aggregate number of the pupils is about 6650, of whom above 1000 are in that of Cagliari. In pursuance of an ordinance of the late King Charles Felix, dated 1823, most villages have an elementary school for boys, in which reading, writing, and arithmetic are taught, besides the doctrines of religion and the elementary principles of agriculture. There are no public establishments for female education; those young females who can afford it become for a time boarders in the convents of nuns. It was stated some years ago by the Baron Ferussac, in the 'Bulletin Universel des Sciences,' from authentic sources, that the results of elementary instruction and other improvements, such as the opening of roads and the establishment of a more effective police, which have taken place within the last twenty years, were already felt in the manners and morals of the people, and that murders, for instance, which are said to have amounted once to above 100 in one year, had decreased by about one-half.

The art of medicine is not in great repute among the Sards, and they have a proverb, 'Bivi de miegu e mori miserabile;' 'Whoever lives by the doctor dies miserably.' In almost every town there is an hospital for the sick, the insane, and the foundlings, supported by bequests and voluntary contributions, and served by the Benfratelli, or Order of S. Juan de Dios.

Although sciences and literature are not much esteemed in Sardinia, yet the island has produced many learned men, of whom few are known beyond its precincts. The following deserve particular mention:—Fara, author of the work 'De Rebus Sardois,' Cagliari, 1580; Father Madao, who has written on the language of Sardinia; the judge Mameli, who published an improved edition of the 'Carta de Logu;' Matthejo, author of 'Sardinia Sacra,' fol., Rome, 1761; the jurist and historian Azuni, and his opponent, Father Napoli, who has refuted, in his 'Note Illustrate,' many of Azuni's statements concerning his native country; Cetti, the author of a very creditable work on the natural history of the island, 'Anfibj, Pesci, Uccelli, e Quadrupedi della Sardegna,' 3 vols. 8vo., Sassari, 1774; and lastly, Don Giuseppe Manno, who has published a good history of Sardinia, 'Storia di Sardegna,' 3 vols. 8vo., Turin, 1826, as well as a little work on the 'Vizi dei Litterati;' besides several poets, either in the vernacular language or in Italian and Latin.

The mechanical arts are in a very low state; the guns of Tempio are in some repute, but the cutlery is of the commonest sort; the potteries are very coarse, and wooden platters are used by the country people; builders and carpenters are very indifferent workmen, besides which all artizans are extremely indolent. Superior workmen come from Piedmont or Genoa.

The principal towns of Sardinia are:—1, CAGLIARI, the capital and the residence of the viceroy. 2, Sassari, the head town of the north part of the island, situated on a gentle declivity, in a pleasant and fertile country, about nine miles from the coast, is little if at all inferior to Cagliari, and, from its healthiness and other circumstances, preferable to it as a residence. Sassari has a good main street, which is the only one paved, fine public walks, shaded by trees, outside of the walls, twenty-four churches, ten convents, three nunneries, a clerical seminary, the university, a college kept by the Jesuits, several palaces, among which those of the governor and of the duke dell'Asinara are the largest and most remarkable, a public hospital, two tolerable 'locande,' or inns, besides coffee-shops, and some good shops of various kinds, among others a bookseller's shop, a rarity in Sardinia; about 20,000 inhabitants. The cathedral is a large structure, with a very elaborate façade. Provisions are good, abundant, and cheap; fruit and garden vegetables are excellent, wine good, and of various sorts. The town has no springs or wells, but good water is brought to the houses by water-carriers, from a handsome fountain called del Rosello outside of the walls. Sassari was built in the seventh century of our æra, by emigrants from the antient town of Turris, which had been ruined by the Longobards. A fine road leads to Porte Torres, which is the nearest harbour; and where the mail packet puts in from Genoa twice a month. 3, ALGHERO. 4, Oristano, a town of about 4,500 inhabitants, in a low unhealthy plain, near the mouth of the Tirsi, has several churches and convents, a clerical seminary, a college kept by the Scolopj, and a spacious cathedral, with a detached octangular belfry, which is the most striking object in the town. A spiral staircase of 150 steps leads to the top, from whence there is a splendid view. Oristano is a busy lively place in the winter and spring, but in summer all those who can, leave it for a healthier residence. Several noble families inhabit the town. 6, Bosa, a town of about 3500 inhabitants, finely situated in a valley, between two flat-topped hills, on the north bank of the river Termo, a short distance from the sea. Bosa has nine churches, some convents, a clerical seminary, several paved streets, and a long bridge over the river. The country around is very productive of oil, wine, fruit, flax, cheese, &c., and the inhabitants are very active; most of the travelling pedlars about the island are from Bosa. But the town is extremely unhealthy in summer. 6, Iglesias, a pleasant town, in a healthy spot, on an elevated and fertile plain, amidst limestone hills, is abundantly supplied with good water, conducted by an aqueduct, 8000 feet in length, to a fountain in the centre of the town. The streets are dirty and ill-paved, but they contain some good houses. The cathedral and bishop's palace are remarkable structures. The town is surrounded by a dilapidated Pisan wall, and the remains of a castle are seen on a hill to the north. Iglesias reckons about 9000 inhabitants. 7, Tempio, the head town of the mountainous province of Gallura, in the north-eastern highlands, stands in a very healthy situation; it has several large houses three stories high, built of granite, with wooden balconies, a collegiate church, a nunnery, a Scolopj college, and about 6000 inhabitants. The general appearance of the town is gloomy, as well as the dark dresses, black bushy hair and beards of the men, and the Moorish costume of the women, who, though generally handsome, stalk about with a coarse woollen petticoat turned over their heads so as to conceal their faces. 8, Quartu, east of Cagliari, near the sea-coast, has about 5000 inhabitants, and carries on considerable trade in wine, fruit, and fisheries. 9, Villacidro, at the foot of the mountains north-west of Cagliari, in a healthy situation, has 5500 inhabitants. 10, Osilo, on a mountain 2000 feet above the sea, east of Sassari, has 5400 inhabitants. 11, Sorso, in the same district, has 4000 inhabitants. 12, Bonorva has 4000 inhabitants. There are many large villages of between 2000 and 3000 inhabitants, scattered all over the island.

History of Sardinia.—Iolaus is said to have led a Greek colony into Sardinia, and to have founded Olbia on the north-east coast, afterwards a considerable town in the Roman period, and of which vestiges are found near Terranova.

Strabo (p. 225) says that the colonists of Iolaus inhabited the island jointly with the barbarians, who were Tyrrheni. From an inscription found at Stampace, it appears that Caralis or Cagliari assumed at one time the name of 'Civitas Iolæ.' The island became well known to the Greeks, and Herodotus (v. 106) mentions that Histæus of Miletus promised to Darius the son of Hystaspes that 'he would render the great island of Sardo (Sardinia) tributary to his power. According to Pliny, Timæus called the island Sandaliotis, from its resemblance to a sandal: it was also called Ichnusa by the Greeks, from its likeness to the print of a foot.

Nura, afterwards one of the chief towns of the island, is particularly noticed in the Roman period on account of the inhabitants having accused the prætor Scaurus of malversation, on which occasion Scaurus was defended by Cicero. But the ante-Roman origin of Nura is proved by one of those singular structures called Nuraggi, which is a large cone, constructed of coarse blocks without mortar, and flanked by four small ones, upon which rests the foundation of a Roman aqueduct that supplied Nura with water. There are also at Nura other Roman remains, such as a small theatre, baths, &c., all very much defaced. Nura is said to have been destroyed in the wars of the Vandals. The Nuraggi are attributed by some to Iberian colonists and their leader Norax. They are a kind of tower in the form of a truncated cone, constructed of large blocks of stone, lava, porphyry, or freestone, without cement, and forming two concentric walls, between which are stairs leading to the summit. The inner part has generally two vaulted rooms, one above the other. The entrance at the base is very low, and leads through both walls to the lower chamber. The stairs give access to the upper chamber. The Nuraggi are of two sorts; the most common, and probably the most antient, bear no marks of the chisel, and are constructed of massive blocks, with irregular faces, and smaller stones in the interstices. The exterior materials of the others are evidently worked by tools; and though the stones are not exactly square, they are placed in horizontal layers, and gradually diminish in size towards the summit. The Nuraggi stand generally on the summit of hills commanding a view of the plains. Some rest upon a solid and spacious substructure or platform walled round in the same manner, and in which are constructed hidden chambers, which communicate with the central one by a covered gallery. Captain Smyth gives the plan and section of one of these, which is in the plain of Giavesu near Bonorva. It is about 40 feet high, including the substructure, and the cone is about 40 feet in diameter where it rises above the substructure. One of the loftiest Nuraggi is between Samagheu and Fordungianus, in the district of Busachi, east of Oristano: it is nearly 60 feet high, and is called by the natives 'Su Nuraggi longu.' Nuraggi are scattered all over Sardinia, to the number of several hundred, and are seen in every state, some nearly perfect, others a heap of rubbish. They are very numerous in the district of Sulcis, or the south-west part of the island, and also in the hilly region of Le Marghine, north of Oristano. There are also fine specimens of them in the Campo d' Ozieri, and at Isili and Gennuri in the Campidano. The original purpose of these buildings was probably for watch and defence, though in after-ages some of them may have been used as monuments for the dead, fragments of Roman terracotta and coins of the Empire having been found in them; neither literal nor symbolical characters are discovered in these singular structures.

The first Carthaginian expedition to Sardinia, of which the epoch however is not ascertained, was led by Machæus, or Malchus, or Melech, who landed on the island, but was defeated by the natives, for which he was banished on his return to Carthage. Some time after, about 490 B.C., Hasdrubal and Hamilcar, sons of Mago, led another expedition to Sardinia, which gained a footing in the southern part of the island, and built or colonized Caralis and Sulcis. Hasdrubal however lost his life in fighting against the natives, who appear to have struggled bravely against the invaders.

We have no account of the wars of the Carthaginians in Sardinia, but it appears that they never reduced it entirely, as the natives took refuge in the mountains, ever ready to rise at any favourable opportunity. The lower country however was permanently in possession of the Carthaginians until the first Punic war. Sulcis was one of their chief colonies, but the site of that once wealthy town is now a subject of controversy, some placing it on the southern coast, where a district still retains the name; whilst others, with more plausibility, place it in the small island opposite, called S. Antioco, north of the town of that name, where considerable remains of walls, of a moat, and an extensive necropolis are seen, and where, in 1819, an inscription was found, in which Sulcis is styled a Roman municipium, and the name of the chief magistrate, L. Corn. Marcellus, is recorded. In the same neighbourhood, in 1820, part of a brass armour was discovered, which is now in the museum of Cagliari, and which is believed to be of Greek workmanship. (Grassi, *Ricerche Storiche intorno alle Armature scoperte nell' Isola di S. Antioco.*) In the neighbouring island of S. Pietro an amphora full of Carthaginian brass coins was found by a farmer in ploughing the ground, while Captain Smyth was at anchor near the spot.

During the first Punic war the Romans attacked and defeated the Carthaginian fleet at Olbia, where Hanno, the commander, fell; and again they gained another naval victory over the Carthaginians at Caralis, but they do not seem to have got a permanent footing on the island, which at the conclusion of the war still belonged to Carthage. But the mercenary troops that garrisoned the island, following the example of those at Carthage, revolted, and killing their commander Bostar and the other Carthaginians, took possession of the principal strongholds, and committed all kinds of depredations on the natives, who rose in arms, and at last drove them away. The mercenaries repaired to Italy, where they were countenanced by the Romans, eager for a pretence to seize upon that fine island. Taking advantage of the condition of their rivals, who were just released from the horrors of the war of the mercenaries, the Romans threatened Carthage with a new war unless Sardinia were formally made over to them. The Carthaginians were obliged to comply, besides paying the expenses of the Roman armament. The Romans, under T. Manlius Torquatus and M. P. Matho, met with considerable resistance from the Sards, but they succeeded in subjugating the principal part of the island, which was incorporated, with Corsica, into a Roman province, under a prætor, about B.C. 228.

After the breaking out of the second Punic war, the Sards, weary of their Roman masters, applied to Carthage for assistance. The Roman garrisons were in a weak state, and the prætor Q. M. Scævola was ill from the climate. The senate sent T. M. Torquatus with reinforcements to Sardinia, where he found the natives of the central part in open insurrection, under a chief called Arsicorus, who was soon after joined by a Punic force. A general battle took place near Caralis, in which the Sards and Carthaginians were utterly defeated, and Cornus, the stronghold of the insurgents, surrendered to the Romans. (Liv., 23, c. 40, &c.) After this Sardinia remained quite during the rest of the Punic war.

About 178 B.C., Sardinia, being in a state of open insurrection, was made a consular province, and T. Sempronius Gracchus was sent to it with an additional force of two legions and 12,000 Latin confederate troops. Sempronius defeated the Ilienses, the supposed descendants of some Trojan emigrants, and the Balari, another fierce tribe, believed to be the descendants of Iberian colonists, who lived in the eastern highlands. All the people of Sardinia returned to the allegiance of Rome, and a double tribute was imposed upon them. The number of prisoners brought to Rome, and there sold in the market as slaves, gave rise to the proverb, 'Sardi venales,' which, from its double meaning, was afterwards construed into a term of reproach. It was stated that 80,000 Sards had either fallen or been made prisoners.

Caius Gracchus, the son of Sempronius, being quæstor in Sardinia, the Barbaricini, or mountaineers of the district still called Barbargia, revolted again, and another expedition was sent from Rome to subdue them, on which occasion bloodhounds were employed. Gracchus was accused by his enemies at Rome of courting undue popularity with the Sards to the detriment of his own country. He repaired to Rome, and eloquently defended himself from the charge, stating that it was true 'he had neither exacted forced gifts, nor torn women from the arms of their husbands, nor brought away vases full of money after emptying the wine out of them, as many other Roman officers had done; but that he had gone to Sardinia with a full purse and had returned with an empty one.' His vindication so pleased the people of Rome, that they elected him tribune.

During the great civil wars Sardinia shared the calamities of the rest of the Roman provinces, following alternately the fortunes of Marius or Sulla, of Cæsar or Pompey. By the peace of Misenum, Sextus Pompey retained Sardinia with Sicily and Achaia. But his freedman Menodorus, who was prætor of Sardinia, forsaking his master, gave up the island to Octavian. The island remained quiet during the period of the Empire, being considered by the Romans as one of their granaries and a penal colony for their criminals.

Tiberius sent thither 4000 Jews to make war upon the freebooters who plundered the country, or to die of its malaria. Pliny (iii. 7) mentions Caralis, Sulcis, Nora, and other places as towns that had the Roman civitas, and Turris Libysonis as a colonia.

After the death of Valentinian III., Genseric, king of the Vandals, invaded Sardinia from Africa. The emperor of the East, Leo, sent an expedition against Genseric, which retook Sardinia, but the latter soon after recovered possession of it. His son Hunneric, being an Arian, like his father, persecuted the Catholics or orthodox with great cruelty, as well as his successors. Sardinia became a place of banishment for the orthodox prelates of the Vandal dominion. After the overthrow of the Vandal kingdom by Belisarius, Sardinia was annexed to the prefectship of Africa, and was governed by an officer styled duke. About A.D. 594, Zabardy, duke of Sardinia, having defeated the tribe of Barbaricini, obliged them to abandon idolatry as a condition of pardon. This forced convention however was eluded by many, and the archbishop Januarius went to Rome to complain that by giving a fee to the military officers of the emperor, the natives were allowed to sacrifice to their heathen deities.

Pope Gregory the Great, in his Epistles, complains of the loose conduct of the clergy of Sardinia. The Saracens began, about the year 720, to ravage the coasts of Sardinia; and as the Byzantine emperors were unable to protect their distant dependencies, the natives applied for assistance first to the Longobards, and afterwards to Louis le Debonnaire, Charlemagne's son, to whom they tendered their allegiance.

About the year 1000, Musait, a Moorish chieftain, sailed from Africa to Cagliari with a large force, took it, and conquered the greater part of the island, and assumed the title of king of Sardinia.

Musait, not content with the possession of Sardinia, sent from thence armed vessels to ravage the coasts of Italy. The pope issued a bull against him, offering the investiture of the island to those who should drive him out of it. The Pisans sent an armament which took possession of Cagiari. Musait came with a strong force by sea and by and, A.D. 1015, and obliged the Pisan garrison to capitulate, but massacred the Pisans as they came out of the town. Musait then sailed for the coast of Luna in Italy, and surprised and sacked that town. He was however attacked in his retreat, and lost most of his men, and even his wife, who was taken prisoner and beheaded. Musait escaped o Sardinia. The pope's legate now persuaded the Genoese o join the Pisans against Musait. The combined forces of the two republics attacked the Moors and drove them away from both Sardinia and Corsica (A.D. 1016-1017). After this 'the Genoese kept for themselves Corsica and Capraja, and the Pisans had Sardinia.' (P. B. Burghi. *De Dominio in Mari Ligustico.*) Musait however, having obained reinforcements from Africa, was still in the field in Sardinia, when the Genoese again assisted the Pisans in driving him away, A.D. 1022. The island being finally cleared of the Moors, the Pisans divided it into four proces, called Giudicature, and appointed Pisan noblemen ver each, styled 'Giudice,' each independent of the others, but all feudatory to Pisa. Cagliari in the south, Torres in he north, Gallura in the east, and Arborea or Oristano in he west, were the names of the four judicatures. Some places along the northern coast were however assigned to he Genoese, among others Castel Sardo, which was for a ong time in the possession of the Doria family, who built castle near it, still called Castel Doria.

The republic of Genoa however was dissatisfied at not aving a larger share of the island, and this creating a feeling of bitter animosity, led to those disastrous wars between Pisa and Genoa, which, after a lapse of more than two enturies, ended with the ruin of the maritime power of he former. [PISA, HISTORY OF.] Sardinia meantime ontinued under its 'judges' liege to Pisa, till 1164, when Barisone, judge of Arborea, instigated by the Genoese, offered to the emperor Frederic I. a sum of 4000 silver marks, besides an annual tribute, for the investiture of the crown of all Sardinia, and he was actually crowned at Pavia by the bishop of Liège, acting for the emperor, the commune of Genoa being security for the payment. The other three judges however were not disposed to submit to Barisone, who appears to have been a shallow-headed man, and having received assistance from Pisa, they ravaged the territory of Arborea. The Genoese as protectors of Barisone, whom they kept in custody at Genoa for his debts, laid claim to his dominions, and sent a fleet to Sardinia, which sacked and burnt the city of Torres. After the war had lasted ten years, Barisone, who had been released from custody, made his submission to the authorities of Pisa. The dominion of the island however remained long after a constant subject of contention between Pisa and Genoa, whilst the lords of the various provinces made themselves independent in reality. The emperor Frederic II. took advantage of this to make his natural son Hentzius king of Sardinia. For this purpose he negociated, in 1238, a marriage between him and Adelasia, the relict of Ubaldo, judge or prince of Gallura and Torres, who had however already made a bequest of her territories in favour of the papal see, in case of her dying without issue. Hentzius was proclaimed king of Sardinia, and having possession in right of his wife of the two northern judicatures, he added to them that of Arborea, whose judge, Pietro di Capraia, had thrown off his allegiance to Pisa. Cagliari alone continued in the allegiance of the republic. The subsequent disputes however between Frederic II. and the pope made Hentzius and the Pisans, who were Guibelines, join together against the pope and the Genoese, and their combined fleet defeated, in 1241, a Genoese squadron, and took twenty-two galleys with a number of prelates, apostolic legates, and ambassadors, who were going to Rome to attend the general council convoked by Pope Gregory IX. Hentzius distinguished himself for his bravery and determination both in Sardinia and Sicily, where he fought for many years for his father against the pope and the Guelphs, until he was taken prisoner by the Bolognese in 1249, who kept him in confinement for the rest of his life, during which he bore the title of King of Sardinia. His title was however a mere name, and the various judges of the island ruled as independent princes, whilst Pisa and Genoa continued to fight for their respective claims to the nominal sovereignty. Cagliari and some other towns continued to be garrisoned by Pisan troops. After the defeat of the Meloria (A.D. 1284), by which the Pisan naval power was annihilated, proposals were made by the Genoese to release their numerous prisoners, provided Pisa would make a cession of Sardinia, and give up the castle of Cagliari into the hands of the Genoese; but the prisoners themselves, it is reported, protested against recovering their liberty at such a price. Some years after, Nino Visconti, judge of Gallura, related to the famous count Ugolino, acted a considerable part in the civil broils of Pisa, which ended with the catastrophe of Ugolino and his family.

In 1297, pope Boniface VIII., wishing to obtain the crown of Sicily for his protegé Charles II. of Anjou, king of Naples, induced James of Aragon to give up Sicily, in exchange for which Boniface, in the plenitude of his assumed power of disposing of crowns and principalities, gave James the investiture of the kingdom of Sardinia as a fief of the see of Rome. Although the Sicilians themselves did not consent to the exchange, and proclaimed Frederic, James's brother, as their king, the investiture of Sardinia was confirmed to James by pope Clement V., in 1309. James however was not ready to enforce his claim till 1323, when he made large preparations on the coast of Catalonia for an expedition to Sardinia. The Pisans reinforced their garrisons in the island, and granted an amnesty to all outlaws who should enlist in their service. Hugo, judge of Arborea, however threw off his allegiance, and in order to facilitate the Aragonese occupation, he laid a plot for massacring all the Pisans in his dominions, which extended over the whole western part of the island. The plot being executed with the most merciless punctuality, he dispatched a messenger to Barcelona to hasten the departure of the expedition. In June the Infante Don Alonso arrived in the Gulf of Palmas, and having landed his troops, was joined by Hugo and some of the native nobles, who tendered their allegiance to his father the king of Aragon. The combined forces then besieged Iglesias, and after several months' resistance the Pisan garrison capitulated through famine. The Infante then proceeded to blockade Cagliari by sea and land. A Pisan fleet of fifty-two galleys arrived in the gulf in the spring of 1324, and landed a body of troops, which were joined by some of the natives, but being defeated by the Aragonese, a treaty was concluded by which Sardinia was given up by the republic to the crown of Aragon, on condition that the Pisan inhabitants and their property should be respected, and that the castle and suburbs of Cagliari, with the port, and the adjoining lakes should remain in possession of Pisa, on payment of an annual tribute as a sign of homage to the king of Aragon. This arrangement did not last long; mutual recriminations took place between the parties, and in the following year, the Pisan squadron being entirely defeated by the Aragonese in the Bay of Cagliari, the town was evacuated, and Sardinia was entirely lost to Pisa. But the judges were no more inclined to submit to their new masters than to the Pisans, and being assisted by the Genoese colonists of Castel Sardo and Castel Doria they blockaded Sassari, and carried on for many years a destructive warfare against the Aragonese. At last Peter the Ceremonious, king of Aragon, landed in 1354 with a strong force at Porto Conte, and having traversed and pacified the principal part of the island, made his public entry into Cagliari, where in April of the following year, with a view of checking the influence of the factious chiefs, he convoked a general parliament, after the model of the Cortes of Spain, consisting of prelates, peers, and commons, which was called 'Stamenti,' or Estates. He thus laid the foundation of a representative government in Sardinia, which, although on a contracted basis, has been the means of saving the island from military despotism, and still subsists at the present day. Neither Mariano, judge of Arborea, nor Doria, the head of the Genoese faction, attended the congress; and after Peter had returned to Spain, Mariano intrigued with pope Urban V. to obtain the investiture of the island for himself. His death in the plague of 1376 prevented his succeeding in his projects, and his son Hugo, who was as ambitious as his father, was murdered by his own subjects at Oristano in 1383. Brancaleone Doria, who had married Eleanor, daughter of Mariano, offered his services to the king of Aragon to bring the whole of Sardinia into subjection; but his wife, who was equally as ambitious as her father and brother had been, put herself at the head of a strong party of natives, who named her son judge of Arborea. Brancaleone, who had gone to Spain, was detained there as a hostage, and after fruitless negociations, Eleanor took the field, being joined by the people of Gallura, and drove the Aragonese from almost the whole northern division of the island. She ruled for several years by the name of 'Giudicessa,' but in fact as queen of Sardinia, and she compiled for her subjects the 'Carta de Logu,' or code of laws already noticed. This remarkable woman died of the plague in 1403, and her only son dying in 1407, without issue, the Sards invited over the viscount of Narbonne, husband of Beatrice, Eleanor's sister. But the viscount found an opponent in Brancaleone Doria, who after his wife's death had taken possession of Arborea, and was supported by the Genoese in the north. Martin, king of Sicily, son of Martin of Aragon, being then in Spain, urged his father to prepare an expedition for the recovery of Sardinia. The nobility of Catalonia, Valencia, and Aragon were summoned for the purpose, and the armament, headed by the younger Martin, sailed from Barcelona in the spring of 1409. Having landed and entered Cagliari, he issued from thence with 8000 foot and 3000 horse against the forces of both Doria and the Viscount, who had united against him. A battle took place at S. Luri, in June, 1409, in which the Aragonese obtained a complete victory, Doria was taken prisoner, and the Viscount fled precipitately. Martin however died shortly after of the malaria fever, and the Viscount continued to carry on the war. At last Alfonso V. of Aragon obtained the formal cession of the province of Arborea, in 1428, by paying 100,000 gold florins to the heir of the late viscount of Narbonne, and the whole island became subject to the crown of Aragon. In 1492 Ferdinand the Catholic established the Inquisition in Sardinia, and ordered the expulsion of all Jews who refused to be baptised, and their synagogues to be converted into churches. From that time the Jews have not been tolerated in Sardinia.

By the union of the crowns of Aragon and Castile, Sardinia became an appendage of the vast Spanish monarchy, and was ruled for two centuries by triennial viceroys sent from Spain, under whose administration the country sunk into decay, like Sicily, Naples, and the rest of the Spanish dependencies. In the war of the Spanish succession the mountaineers of Gallura having declared themselves for Charles of Austria, an English fleet under Sir John Leake appeared before Cagliari, and the viceroy capitulated, and the island acknowledged Charles; but by the peace of Utrecht, in 1713, Charles having resigned his claims to Spain, Sardinia was given to him as emperor. In 1717 Alberoni, the minister of Philip V., sent a large force in the midst of peace, under the Marquis de Lede, which took possession of Sardinia in less than two months. [ALBERONI.] By the treaty of London of 1720, Philip was obliged to restore Sardinia, which was finally given to Victor Amadeus, duke of Savoy, who then assumed the kingly title. From that time the history of Sardinia becomes closely connected with that of the house of Savoy. [SARDINIAN STATES.] Under the government of that dynasty Sardinia has materially improved. King Charles Emmanuel III., in particular, has been a great benefactor to Sardinia. Overgrown abuses in the local administration were corrected, a better police was formed, the national laws were confirmed, education was encouraged, Monti Frumentarii were founded for the assistance of small farmers, commercial tribunals were established, as well as the post-office, the Board of Health, and other institutions of civilised states.

In December, 1792, the National Convention, having declared war in the name of the French Republic against the king of Sardinia, sent a lage fleet under Admiral Truguet to attack the island. The Sards however had made some preparations for resistance, and the French, on anchoring before Cagliari, in January, 1793, met with a hot reception from the forts and batteries, whose fire greatly damaged their ships. They landed 5000 men near Quarto, but were repulsed by the natives, who are generally good marksmen and accustomed to the use of fire-arms. A storm which arose completed the discomfiture of the expedition, by the loss of a line-of-battle ship and several smaller ones. The French admiral, after uselessly bombarding the town for several days, reimbarked the soldiers and sailed away, leaving several hundred men killed or prisoners.

The king of Sardinia, pleased with his insular subjects, invited them to ask for anything that they might think useful for the island. The Sards demanded, 1, the convocation of the stamenti; 2, the confirmation of their laws, customs, and privileges; 3, that all offices in the island, except that of viceroy, should be held by natives; 4, the establishment of a council to advise the viceroy; 5, permission to send a minister to reside at Turin and watch over their interests. The Piedmontese ministers however dissuaded the king from listening to the petition; situations continued to be filled with Piedmontese, and the consequence was that insurrections broke out in 1794 and 1795, and the commander-in chief and the intendant-general were killed by the people of Cagliari. By the mediation however of the archbishop of Cagliari and of the pope, a general act of amnesty was proclaimed in 1796, and some of the demands of the islanders were granted. When King Charles Emmanuel IV. was driven away by the French from his continental states, the Stamenti of Sardinia sent a deputation to him at Leghorn to assure him of the entire devotion of the people. The king and his family landed at Cagliari, in March, 1799, where they where received with enthusiasm. The king however returned soon after to the Continent, and in 1802 abdicated in favour of his brother Victor Emmanuel, who, having lost all hopes of recovering his continental dominions, repaired to his island kingdom in February, 1806. Protected from external attack by his alliance with England, Victor resided in Sardinia till the fall of Napoleon, in 1814. During his residence at Cagliari he paid much attention to the agriculture of the island, as well as to the administration, but his pecuniary means were very limited. Still he was liked, although the expenses attending the residence of a court, however modest, as it necessarily was, pressed heavily upon a people under feudal tenure. Some local disturbances occurred in 1807, in the northern part of the island, the people of which have always been more easily excited than those of the south. On this occasion the insurrection assumed something of the character of a servile war, the peasantry against the nobles, the former pretending to be zealous for the predominance of the king's authority over the feudal aristocracy. Many of the baronial palaces were destroyed, among others that of Sorso, a town of 4000 inhabitants north-east of Sassari. At last the king's troops quelled the insurrection, and several of the leaders, who were not all peasants, were either executed or condemned to prison for life, which, in the present state of the Sardinian prisons, is worse than death.

In 1814 Victor Emmanuel returned to Turin, leaving his brother Charles Felix, duke of Genevois, viceroy of the island. In 1821, in consequence of the abortive insurrection of the Constitutionalists of Piedmont, Victor abdicated in favour of his brother, who took much interest in the affairs of Sardinia. Charles Felix was the founder of the Agrarian Society and of the museum of Cagliari; and he was the first to plan and execute a great carriage-road throughout the island.

SARDES (Σάρδεις), the antient capital of Lydia, now *Sart*, was situated in the spacious valley of the Hermus, and on the Pactolus, one of the tributaries of that river. The south side of the valley is bounded by the lofty range of Tmolus, the highest summits of which are generally covered with snow. The most remarkable feature in the site of Sardes is the Acropolis, one side of which, towards Tmolus, is so steep, that in the time of Crœsus, when the rest of the Acropolis was fortified, this part was considered secure against an enemy. It was on this side however that the place was taken by the Persians under Cyrus (Herod., i. 84). The Acropolis is continually crumbling, and it presents a very rugged and fantastic outline. There are the remains of a large and magnificent temple, the western front of which is on the bank of the Pactolus, and the eastern under the steep rock of the Acropolis. Two columns of the exterior order of the east front, and one column of the portico of the pronaos, with their capitals, are still standing; but the columns are nearly half buried in the accumulated soil. It is probable that the greater part of the temple might be discovered by an excavation. The capitals are Ionic, and exceedingly fine specimens of the order. (Cockerell.) There are the remains of two Christian churches, one of which is constructed of magnificent fragments of older buildings. Under the north side of the Acropolis there are traces of a theatre and an adjoining stadium: the exterior diameter of the theatre was 396 feet, and the interior 162. It is uncertain what the building was, commonly called the Gerusia, the remains of which are in the plain to the west of the Acropolis. Sart is now a miserable place, consisting of a few mud huts.

According to Strabo (p. 625), Sardes, though an antient city, was of more recent origin than the date of the Trojan war. Sardes was the capital of the Lydian kings, whose dynasty ended with Crœsus. After Asia Minor came under the dominion of the Persians, it was the residence of the Persian governor of this part of Asia. In the reign of Darius the place was surprised by the Ionians, aided by the Athenians, and the greater part of the city was burnt, owing to a soldier setting fire to the houses which were thatched. (Herod., v. 101.) When Alexander the Great entered Asia on his Persian campaign, Sardes surrendered to him. In the time of Tiberius, Sardes, with other cities of Asia nor, suffered much from an earthquake, but the calamity was alleviated by the munificence of the emperor. (Tacit., *Ann.*, ii. 47.) Sardes was one of the seven churches of Asia mentioned in the book of Revelation. Julian, in his attempt to restore the heathen worship, built altars at Sardes, and repaired some of the temples.

Lake Gygæa is about five miles north of Sardes, and the burial-places of the Lydian kings were near it. The barrows are of various sizes, covered with green turf, and ny of them retain their conical form. One, which is of ch superior magnitude to the rest, is the mound of Alyattes. [Halyattes.]

SARDINIA. [Sardegna.]

SARDINIAN STATES (STATI SARDI) is the name of the dominions of the house of Savoy, which constitute a monarchy, the head of which derives his title of king from the island or kingdom of Sardinia. These states consist of —1, the duchy of Savoy; 2, the principality of Piedmont, in its larger sense; 3, the duchy of Genoa; 4, the county of Nizza; 5, the island of Sardegna, which forms a separate state, and has its own distinct administration. A geographical description of each of these great divisions is given under their respective heads. The continental territories, 'Stati di Terra Ferma,' which have a population of 3,675,000 and an area variously stated by some at 16,000 and by others at 17,000 square Italian miles (60 Italian miles to a degree of latitude), have now one uniform system, administrative and judicial, being divided into 40 provinces, namely: 1, Savoy Proper, chief town Chambéry; 2, Tarantasia, chief town Moutiers; 3, Maurienne, chief town St. Jean; 4, Haute Savoie, chief town Hopital; 5, Genevois, chief town Annecy; 6, Carouge, chief town St. Julien; 7, Faucigny, chief town Bonneville; 8, Chablais, chief town Thonon; 9, Aosta; 10, Susa; 11, Valsesia, chief town Varallo: 12, Ossola, chief town Domo d'Ossola; 13, Pallanza; 14, Biella; 15, Novara; 16, Vercelli; 17, Lomellina, chief town Mortara; 18, Casale; 19, Torino; 20, Pinerolo; 21, Alba; 22, Saluzzo; 23, Cuneo; 24, Asti; 25, Alessandria; 26, Mondovi; 27, Acqui; 28, Ivrea; 29, Tortona; 30, Voghera; 31, Bobbio; 32, Novi; 33, Genova; 34, Savona; 35, Albenga; 36, Oneglia; 37, San Remo; 38, Nizza; 39, Chiavari; 40, Spezia. An account of most of these provinces and their chief towns is given under their respective heads, as well as under the names of some of the old divisions of the country, such as Monferrato and Novara.

Each province is administered by a political officer called intendente, appointed by the king. The province being an aggregate of communes, each commune has a sindaco, or maire, who is subordinate to the intendente. For judicial purposes, each province has a collegiate court, called Tribunale di Prefettura, which sits in the chief town. There is no jury in the Sardinian states. The provinces are divided into districts called Giudicature, in each of which there is a judge called Giudice di Mandamento, answering to the French Juge de Paix, with a secretary. There are in all 412 of these giudicature. There are four supreme courts, which are also courts of appeal from the Tribunali di Prefettura, and which are called Senato. The senate of Turin has jurisdiction over all the provinces of Piedmont in its most extended sense, that is to say, all the provinces on the Italian side of the Alps and north of the Ligurian Apennines. The jurisdiction of the senate of Genoa extends to all the provinces of the duchy of Genoa, with the exception of San Remo. That of the senate of Nizza extends to the provinces of Nizza, Oneglia, and San Remo. The senate of Savoy, which sits at Chambéry, decides all suits within the limits of the duchy of Savoy. Each senate forms two chambers, one for civil and the other for criminal matters. All trials for felony or high treason appertain to the senate. The senate registers all edicts, letters patent, and ordinances of the king, and is allowed to make remonstrances upon the subject of them; and it also decides contests concerning jurisdiction between the various authorities, as well as between the ecclesiastical and lay courts. In these and other important questions the two classes or chambers of the senate join in one body. The senators vote with closed doors; the president collects the votes, and secrecy concerning the individual votes is strictly enjoined on pain of dismissal. The senators are named as vacancies occur by the king for life, after a previous examination of the candidate by the senate, and they can only be dismissed for grave misconduct by a sentence of the senate itself. They are generally men of high character and acquirements, they have good salaries, and their probity is considered above suspicion.

A court styled Regia Camera dei Conti sits at Turin, and decides in all fiscal and feudal suits, for although political feudality is abolished, manorial and other territorial rights still remain, as well as Castellanie, or manorial courts, for petty suits; it acts also as an audit court over the treasury accounts, and also as a criminal court for all offences against the fisc, for the crime of coining, and also for malversations of the administrative officers. There is an admiralty court, which sits at Genoa.

Commercial courts are established at Turin, Chambéry, Nice, Genoa, Chiavari, Savona, Novi, and San Remo. Those of Turin, Chambéry, and Nice are called Consolati; the others, Tribunali di Commercio.

Ecclesiastical courts, Curie Vescovili, exist in every diocese; their jurisdiction comprehends matters relating to marriage and the misconduct of clerical persons, but for graver criminal charges ecclesiastics are tried by the respective senates, which judge also in civil matters concerning members or bodies of the clergy.

The old continental territories of the house of Savoy were administered till lately by the Reali Costituzioni, a compilation of numerous edicts and decisions of the dukes of Savoy, which was published in 1770, and is mainly based on the Roman and canon laws. The penal laws were very severe; blasphemy and sacrilege were punished by the galleys or death; a very extensive interpretation was given to the crime of high treason, which was punishable in most cases by death and confiscation; the same penalties were inflicted on duellists; domestic theft was punished in most cases by death; the body of a suicide was hanged; usury was punished by confiscation; the use or simple possession of offensive weapons was punishable by the galleys; libels were left to the discretion of the judge, who could inflict even the punishment of the galleys for life, according to the circumstances of the case. Correctional matters were left entirely to the discretion of the 'Tribunali di Prefettura.' The method of proceeding in criminal cases is the same as it was in the last century in most other parts of continental Europe, and still is in some, that is to say, secret, the depositions being taken in writing, and the witnesses, as well as the accused, being examined privately by the instructing judge, and often by the judge di mandamento, or local justice of the district where the offence had been committed; upon which the fiscal advocate, or king's attorney, draws the act of accusation, a copy of which is given to the accused, whose counsel replies to it in his defence. One of the judges delegated for the purpose examines the acts of the proceedings for and against the accused, and makes his report to the court, which, after examining and comparing the conclusions of the fiscal advocate with those of the council for the defence, pronounces its sentence. Neither the accused nor the witness appears before the court, nor is the accused confronted with the witnesses against him, except in rare cases.

The punishment of the wheel, which was in use in 1817, has been abolished since, as well as the torture. A new code, entitled Codice Albertino, has been promulgated very lately by the reigning king Carlo Alberto, but not having seen it, we cannot say how far it differs from the old one.

The towns and other communes have a communal council composed of notables of the place, at the head of which is the syndic, who is appointed by the king, and renewed every two years. The council superintends the local and economical administration of the commune, but its acts are subject to the sanction of the intendente of the province. The communes vary greatly in size, and especially in the amount of population, from 200 inhabitants to 120,000, which is the population of that of Turin. The very populous communes, consisting of large towns, such as Turin, Genoa, Alessandria, &c., have two syndics.

The city of Turin has a kind of charter with peculiar and extensive privileges, a numerous municipal council called Corpo Decurionale (council of civil administration), and a Vicariato, or judicial and political council, which superintends the police of the town; a Consiglio degli Edili, composed of architects and engineers, to superintend all buildings, works, and embellishments of the capital, and a Segreteria, or finance department, the city of Turin being possessed of large revenues derived from the octroi and other local taxes, besides landed property and manorial estates, with feudal jurisdiction over several villages. It is styled in public documents, L'Illustrissima Citta di Torino, Contessa di Grugliasco, Signora di Beinasco.'

The government in the Continental states of the house of Savoy is an absolute monarchy, the king being the sole source of law. All the laws emanate from him, and are promulgated in his name. He can abrogate all decisions and sentences even of judicial bodies. He imposes the taxes, and has the uncontrolled administration of the revenue. He or his delegates in his name appoint to all offices civil, military, and judicial. This form of pure monarchy dates from the reign of Duke Emmanuel Philibert, who, in the sixteenth century, abolished political feudality, and by doing away with the military services of the great vassals, and substituting a payment in money, formed a stipendiary regular infantry, and created the militia called provincial battalions, which was raised from every province in proportion to its population, and being exercised once every year, and receiving one-third of the regular pay in time of peace, was liable to be called out in time of war to join the regular forces. This system continues with some modifications to the present day in all the continental states, the army being recruited yearly by means of a conscription. Every conscript, unless he provides a substitute, is bound to serve eight years in the regular army, after which he is enrolled for eight years more in the provincial battalion of his respective district. In time of war the provincial battalions are called into active service, and the army becomes thereby increased to 100,000 men. The regular regiments are formed into brigades of two regiments, each regiment having three battalions; the battalion consists of six companies, each of which musters 176 rank and file. There are ten brigades of infantry, namely, Guardi, Regina, Savoy, Piemonte, Aosta, Cuneo, Casale, Pinerolo, Savona, and Acqui. The cavalry consists of seven regiments, one of which is raised by voluntary enlistment in the island of Sardinia. There are two regiments of artillery, besides the train, a battalion of sappers and miners, and a corps of engineers. The corps of carabineers, a numerous and most effective body of cavalry consisting of picked men, is, like the French gendarmes, charged with the police of the country, being scattered in stations or detachments all over the various provinces. Both men and officers receive much higher pay than the line, and are handsomely dressed and accoutred. They are generally trusty and well-behaved men, above temptation or bribery, civil to travellers, and are noted for their devotedness to the monarchy, of which they gave abundant proofs during the insurrectionary movements of 1821 and 1831.

The naval force consists of four ships of war, four frigates, two corvettes, and two brigs of war, carrying in all 526 guns, and manned by 3450 men, besides 11 companies of cannoniers, or naval artillerymen, and one battalion of marines. The stations of the royal navy are at Genoa, Villafranca, and in the island of Sardinia. All sailors of merchant vessels and craft in the Continental dominions have their names registered in their respective districts, and when men are wanted for the royal navy, each district is obliged to furnish its quota. The same system prevails in France, and is called 'inscription maritime;' it is in fact a regularised system of impressment under another name, although French and other Continental writers are apt to declaim against the English impressment, which they call tyrannical, forgetting their own much more oppressive conscription of landsmen, and their 'inscription' of seafaring people.

The king's ministry consists of a secretary of state for foreign affairs, a secretary of war and marine, a secretary of finances, and a secretary for the 'interno,' or home department, which is divided into the following offices or boards:—1, General affairs, king's household, ceremonials, and precedence; 2, grace and justice; 3, ecclesiastical affairs, Valdenses, and Jews; 4, communal affairs, public works, waters, and forests; 5, board of trade and statistics, sciences, belles-lettres, and the fine arts: 6, board for the affairs of the island of Sardinia; 7, board of police. There are also a grande cancelleria, or board for receiving and examining memorials to the king, and reporting to him thereupon; an intendant, or master of the royal household, with many subalterns; a superintendant of the private domain and purse of the king; and a private secretary of his majesty, and a very numerous household.

The public revenue of the Continental states is sixty-six millions of Italian livres or francs, of which seventeen millions are derived from the land-tax, which absorbs one-sixth or one-seventh of the annual rent of the land; thirty-two millions proceed from the gabelle, or customs and excise: the rest is made up of the post-office, registry-duty, monopoly of salt and tobacco, and other sources. The public debt amounted in 1834 to eighty-seven millions of francs. (Serristori, *Statistica dell' Italia.*)

The revenue of the island of Sardinia amounts to about 2,750,000 francs, derived from 'donativi,' as they are called, voted by the stamenti, and by indirect taxes, such as customs, salt, tobacco, and gunpowder, the fisheries, and the forage and royal patrimony, besides a small subsidy of 17,000 francs paid by the clergy.

The ecclesiastical administration of the Continental states is under the four archbishops of Turin, Chambéry, Genoa, and Vercelli, and twenty-six bishops, of Maurienne, Tarantaise, Annecy, Aosta, Susa, Pinerolo, Acqui, Alba, Asti, Cuneo, Fossano, Ivrea, Mondovi, Saluzzo, Alessandria, Biella, Casale, Novara, Vigevano, Albenga, Nizza, Bobbio, Sarzana, Savona, Tortona, and Ventimiglia. The number of parishes is 3756, that of collegiate churches, besides cathedrals, is 74, and that of clerical seminaries 54. In 1833 an ecclesiastical academy for the higher theological studies was instituted at Superga near Turin. There are in all the Continental states convents of monks, of which about one-half are of the mendicant orders. The rest having lost most of their property, which was sold under Napoleon, the restored government has given them property or rents equivalent to a capital of 100 millions of francs. There are 82 convents of nuns.

The number of Jews is about 6740, of whom about 1500 are at Turin, and the rest at Casale, Vercelli, Alessandria, Acqui, Genoa, and other places.

The Valdenses near Pinerolo amount to about 20,500 individuals, and their public worship is now unmolested. Their candidates for the church ministry generally study at Geneva or Lausanne in Switzerland. [VALDENSES.] At Genoa there is a chapel for those Valdenses and foreign Protestants who reside there.

Although the clergy of the established Roman Catholic church have no longer any direct political power or jurisdiction over laymen, there being no Inquisition in the Sardinian states, yet they exert considerable indirect influence, greater perhaps than in any other part of Italy except Rome. The parish clergy exercise an active kind of moral censorship over their flocks. The introduction of prohibited books, especially on religious controversy, is strictly guarded against, and is subject to severe penalties, which some imprudent foreigners have incurred of late years.

The nobility are very numerous in Piedmont; they are chiefly landed proprietors with moderate incomes, many of whom reside in the country. The tone of society is decidedly aristocratical. The commercial class is not so numerous or important as in the duchy of Genoa. Most of the commissions in the army, as well as the principal offices of the administration, are held by noblemen. The nobles have privileges even in courts of justice. 'The clergy and the nobility,' says an observing traveller who wrote in 1834, 'have evidently the upper hand in this country. The throne is supported by the altar; and as the population is generally religious, this support is not so precarious as in some other countries. If there is a vague feeling of discontent among the middle and lower orders, this feeling does not attain the height of revolt; and this has been proved in the late attempts at military insurrection, in which the masses took no part, and the efforts of the French propagandists have found no sympathy here. A great proportion of the inhabitants of Piedmont are landed proprietors, and are therefore attached to order and personal comfort. They have not forgotten the French invasion, they can appreciate the true meaning of a liberty which is enforced by foreign bayonets, and they know that constitutions and systems of government transplanted from abroad seldom take root. All the enlightened liberals here expect no good from either a French intervention or an internal revolution; but they expect much from time and the progress of ideas. These liberals, whom I may style progressive, to distinguish them from those who are merely revolutionists, are numerous in Piedmont, and exist even among the ranks of the nobility. The only part of the French system which they regret is the equality of all before the law.' (Walsh, *Voyage en Suisse, en Lombardie, et en Piémont.*) During the years that have elapsed since the work just mentioned was written, several useful reforms in the administration and in the municipal and judiciary systems have been effected by the present king Charles Albert; and although the government continues to be a monarchy, the administration is becoming more enlightened.

Public instruction is afforded by the royal and communal colleges. In every province there are one or more royal colleges, in which grammar, rhetoric, and philosophy are taught; and in some of them there are chairs of law, medicine, and divinity. In most towns there is a communal college, besides grammar-schools, 'Scuole di Latinità Inferiore.' The aggregate number of all these establishments amounts to 286, a number greater in proportion to the population than that of any other Italian state. In the old territories of the monarchy, Piedmont, Savoy, and Nice, the proportion is much greater than in the duchy of Genoa, which is a late acquisition. Of these 286 establishments, 23 are administered by monastic orders, and the others by laymen or secular priests without distinction. The result of all this is, that a considerable degree of information prevails among the upper and middle classes of Piedmont and Savoy. Female education is afforded almost exclusively in the convents of nuns, of which there are 42 that serve for that purpose. Scientific instruction is given in the two universities of Turin and Genoa, the former of which is attended by about 1250 students. [TORINO.] The university of Genoa is attended by about 500 students, and has 36 professors. It has the faculties, or colleges, as they are styled, of divinity, law, medicine and surgery, and philosophy and arts, and a library of 45,000 volumes. Among the professors there have been some distinguished men, such as Viviani, professor of botany, known for his works, and especially for his 'Flora of Libya and Cyrenaica;' and Mojon, professor of chemistry. The great hospital of Genoa, which is admirably administered, affords a good opportunity for the medical and surgical students becoming acquainted with clinical practice. The studies of medicine, surgery, and pharmacy are perhaps those which flourish most at Genoa. The building of the university is vast and splendid, like most architectural buildings at Genoa. A board of instruction, styled 'Deputazione degli Studj,' composed of five members, has the superintendence of the university of Genoa, and of all the colleges and schools, public and private, of the duchy.

At Turin there is likewise a board, called 'Magistrato della Riforma,' which superintends all the establishments of education in the old territories of the monarchy, Piedmont, Savoy, and Nice.

Turin has a royal academy of sciences, a royal agrarian society, a royal academy of the fine arts, a royal military academy, and a philharmonic society. An academy of the fine arts exists at Genoa, an academy of sciences and arts at Alessandria, an economical society at Chiavari, and a royal academy at Fossano. There are a royal school of horsemanship and a royal veterinary school at La Veneria near Turin, a school of mineralogy at the mines of Moutiers in Tarantasia, and a naval school at Genoa.

Elementary education is not in such a thriving condition as collegiate and scientific instruction; most communes have schools for boys, but there is no general or uniform system.

The Continental states of the king of Sardinia have several fine carriage-roads across the Alps and Apennines, which intersect their territory. The most remarkable are:—1, the great road of Mont Cenis, leading from Chambéry to Turin, constructed by Napoleon; 2, that of the Simplon, leading into Switzerland, likewise constructed under Napoleon; 3, the road from Genoa to Sarzana and Lucca along the Eastern Riviera, constructed since the Restoration; 4, the new road from Genoa to Novi by Serravalle, constructed also since the Restoration; 5, the road Della Cornice, from Genoa to Nizza, along the Western Riviera, begun under Napoleon, and finished under the late king Charles Felix. A road leads from La Spezia to Pontremoli, partly through the Sardinian territory, by the valley of the Magra, and thence over the Apennines to Parma. A new road is in progress from Alessandria to Savona by the valley of the Bormida. There is a well-regulated post-office system throughout the Sardinian dominions, as well as diligences for travellers on all the principal lines of road; and public conveyances called Velociferi on the provincial or cross roads. For the important maritime trade of the country, see GENOA.

The plains of Piedmont are well supplied with canals, chiefly for the purpose of irrigation, the principal of which are in the provinces of Alessandria, Vercelli, Biella, Casale, Ivrea, Alba, and Turin. The river system of Piedmont is described under PO, BASIN OF THE.

The staple products of the continental Sardinian territories for exportation are:—silk, which is produced annually to the value of between twenty-four and thirty millions of francs; rice, which is raised in the lowlands near the Po; hemp, wine, and oil. The whole exports amount to about fifty millions of francs. Most of the wine is consumed in the country. The principal manufactures consist of paper, silks, woollens, linen, glass, and cotton yarn. The importation of colonial articles and English manufactures takes place chiefly through the port of Genoa. A considerable trade is carried on with Switzerland and Germany by the Lago Maggiore and the new road of the Bernardin Mount leading to the Grisons.

History of the Sardinian States.—The history of the country is identical with that of the house of Savoy, for, unlike some compact European kingdoms, the various and heterogeneous parts of which the Sardinian monarchy is composed have been gradually united through the personal exertions of its sovereigns, that dynasty having become their common bond of union, and having succeeded also in creating a sort of national spirit where there was no common nationality. The history of such a house is therefore very curious, and forms no unimportant part of the history of

Europe during the middle ages. The origin of the house of Savoy is involved in the greatest obscurity. Some genealogists have derived it from Witikind, the Saxon chief, who fought against Charlemagne; others from Adalbert, son and colleague of Berengarius II., marquis of Ivrea and king of Italy. The first historical ancestor of the house of Savoy is Humbert, called the 'white-handed,' count of Maurienne and great vassal of Rudolf III., the last king of the second kingdom of Burgundy. When Rudolf died, A.D. 1032, Conrad the Salic king of the Germans and emperor of the West, who had married Rudolf's niece, succeeded to his rich inheritance. He found a willing and able assistant in the count of Maurienne, who, commanding the passes of the Alps, was enabled to introduce the Italian militia of the emperor to assist in reducing the other refractory Burgundian vassals. As a reward for these services Conrad not only confirmed Humbert in his extensive fief of Maurienne, but gave him military jurisdiction over other parts of Savoy, the lower Valais, and also the valley of Aosta, on the Italian side of the Alps, which was part of the kingdom of Burgundy. Count Humbert died about A.D 1048, and was buried in the cathedral of St. Jean de Maurienne. His eldest son Amadeus, styled I., succeeded him, but, dying shortly after, was succeeded by his brother Oddo, or Otho, who, by his marriage with Adelaide of Susa, daughter and heiress of Odelric Magnifred, or Manfred, count of Turin and marquis of Italy, extended the dominion of his house to the banks of the Po. These facts have been established by the best Piedmontese critics, and the line of succession from Amadeus I. to Oddo, and from Oddo to his son Amadeus II., is adopted in the official genealogy of the house of Savoy. (Cibrario, *Storia della Monarchia di Savoja*, Turin, 1840.) Former historians had confounded Amadeus I. with Amadeus II., and had left out Oddo altogether. [AMADEUS I.]

The Marquisate or March of Italy embraced the valleys on the Italian side of the Cottian Alps, including several counties, of which that of Turin was the principal. The former duchy of Turin, which in the time of the Longobards embraced the greater part of the actual Piedmont, had been parcelled, by the policy of the Carlovingian emperors, into the counties of Turin, Auriate, Bredolo, Alba, &c. After the Carlovingian empire became dismembered by the forced abdication of Charles the Fat, and Italy erected itself into a separate kingdom, those counties which adjoined the Cottian and Graian Alps became the frontier on the side of the new kingdom of Burgundy, and the military command over the whole border region or marches was given by the kings of Italy to a high noble, called marquis, who had jurisdiction over several counties. [MARCHES, THE.] The marquises of Italy resided generally at Susa, from whence they watched the passes of Mont Cenis and Mont Genevre, and they are accordingly also styled in the chronicles marquises of Susa.

The first husband of Adelaide was Hermann, duke of Suabia, who, after the death of her father Odelric, about A.D. 1036, became marquis of Italy in right of his wife. Hermann dying without issue, Adelaide married, about 1045, Oddo, count of Maurienne, and son of Humbert the White Handed, who by this marriage became marquis of Italy and count of Turin, and master of the principal passes of the Western Alps; for, in addition to that of Great St. Bernard and Little St. Bernard, which were already within his Burgundian jurisdiction, which extended over the valley of Aosta, he became possessed of those of Mont Cenis and Mont Genevre. Of Oddo's life we have no other historical record, except an act of donation, dated A.D. 1056, of some land to St. Peter of Tarantasia, for the good of the soul of his father Humbert. (Muratori, *Antiq. Ital.*, i. 346.) Oddo must have died in or previous to the year 1060, as appears by another donation made by his widow Adelaide, on Trinity Sunday of that year, to the chapel of the Trinity in the cathedral of Turin, for the rest of his soul, in which it is mentioned that Adelaide's father, Odelric Manfred, was buried in that chapel at the foot of the altar. Oddo left by Adelaide three sons, Peter, who is styled marquis, and Amadeus, who is called count, having respectively assumed those titles after their father's death, and lastly, Oddo, who became a bishop; besides two daughters, Bertha, who married Henry, afterwards Henry IV. of Germany, and Adelaide, who married Rudolf, duke of Suabia, who was afterwards elected in place of Henry by his revolted vassals, during the famous War of the Investitures. Adelaide, the mother, appears to have governed, after the death of her husband, as regent or colleague of her son, the extensive territories belonging to them on both sides of the Alps. Cardinal Peter Damianus, her contemporary, who was sent into North Italy as apostolic legate to effect a reform in the clergy, in a letter addressed to Adelaide, styles her duchess and marchioness of the Cottian Alps, and speaks of her jurisdiction as extending to the two kingdoms of Italy and Burgundy, and embracing several dioceses: he extols her firmness in bearing the cares of a kingdom without the assistance of a king. Her eldest son, Peter, married Agnes of Poitou, by whom he had two daughters, Agnes, who married Frederic of Monbéliard, count of Mousson, and Alice, who married the marquis Boniface del Vasto, from whom the marquises of Saluzzo derived their descent. After the death of Peter about 1078, his brother Amadeus became count. Amadeus does not appear to have assumed the title of marquis, the investiture of which, it is believed by some writers, was given to Frederic of Monbéliard, who had married the eldest daughter of Peter, the late marquis.

The emperor Henry IV., being excommunicated and deposed by pope Gregory VII., resolved to proceed to Italy, where he had a party in his favour. The passes of the Eastern Alps being closed against him by the duke of Bavaria and other revolted vassals, he proceeded through Burgundy, and arrived in the autumn at Vevey, on the banks of the Leman lake, where he was met by his mother-in-law Adelaide, and by Count Amadeus, his brother-in-law, whom he requested to allow him to pass into Italy with his wife Bertha and his son Conrad. Adelaide, being already ill-disposed against him for his neglect and ill-treatment of her daughter Bertha, refused him the passage, in order to obtain which the emperor added to the dominions of Amadeus, styled count of Savoy, a fertile province of Burgundy, not specified by the chronicler Lambert, but which is believed to have been that of Bugey. Henry, attended by Adelaide and Amadeus, crossed the Mons Jovis, or Great St. Bernard, in the depth of winter, and they all repaired to Canossa, where Gregory was, and where, partly by the mediation of Adelaide, the reconciliation between Henry and the pope took place, in January, 1077, after a severe trial of humiliation on the part of the emperor. [GREGORY VII.]

Little more is recorded of Adelaide, who appears to have exercised the chief authority in the name of her son Amadeus II. till he died, leaving by his wife Joan, daughter of the Count of Geneva, an infant son, who is styled Humbert II. The Marchioness Adelaide continued to administer to her dominions, as guardian to her grandson, eleven years longer, till she died at a very advanced age in 1091.

Humbert II., Count of Maurienne, succeeded to his father's Burgundian estates in Savoy, and even increased them by the acquisition of Tarantasia, but those on the Italian side of the Alps had been seized upon during his minority by several claimants. Boniface del Vasto, Marquis of Savona, and husband of Alice, Humbert's aunt, took possession of the counties of Bredolo and Aurate, which had belonged to the Marchioness Adelaide, whilst his sister-in-law, Agnes of Poitou above mentioned, occupied the county of Turin, which was also claimed by Conrad, son of Henry IV. of Germany, in right of his mother Bertha. In the midst of all this the great towns, Turin, Asti, Chieri, and others, availed themselves of the general confusion occasioned by the long struggle between the pope and the emperor to assert their independence of all vassalage except the nominal one to the Empire. Humbert crossed the Alps in 1097; and not being strong enough to attack all his opponents, he made a treaty of alliance with the town or commune of Asti and its bishop against Boniface, by confirming the newly acquired liberties of the citizens of Asti, and by ceding to them several villages and territories, and ensuring to them free passage and protection throughout his Burgundian or Transalpine territories. Durandi, in his 'Piemonte Cispadano antico,' gives the text of the treaty, dated July, 1098, between 'the honourable and great Lord Count Humbert of Savoy, and the consuls of the city of Asti,' which is one of the oldest documents in which the consuls appear as first magistrates of an Italian community. Humbert made donations to several churches and convents, and he also intended to proceed to Palestine with the Crusaders; but he died in Savoy in 1103, and was buried in the cathedral of Moutiers in Tarantasia. By his wife Gisla of Burgundy he had a son, who succeeded him by the name of

Amadeus III., and a daughter Adela or Adelaide, who married Louis VI., king of France. Anselm of Aosta, who became archbishop of Canterbury, corresponded with Humbert; and a letter from him to the count, in which he recommends to him the interests and privileges of the churches of his dominions, is contained in the works of St. Anselm. (1196.)

Amadeus III., who has been sometimes styled Amadeus II., received from Henry V. of Germany the investiture of all Savoy as an Imperial county. His predecessors were merely counts of Maurienne, although they had extended their authority over the greater part of Savoy. Amadeus recovered also in part his ancestorial Italian dominions, and, above all, the city of Turin, of which he was acknowledged lord in the year 1131. In his diplomas Amadeus styles himself Count of Savoy, Count of Turin, and Marquis of Italy. In 1140, Guy, Count of Albon, and Dauphin of Vienne, having advanced by the valley of Isère, and laid siege to Montmélian, was defeated by Amadeus, and died of the wounds he received in the battle.

About the year 1147 Count Amadeus III. proceeded with the crusade to Syria, and died of disease at Nicosia in the island of Cyprus, in the year 1148. He was the founder of the magnificent abbey of Hautecombe in Savoy, which was for ages after the burial-place of the princes of the reigning dynasty, whose monuments remained to the end of the last century, when they were plundered and destroyed by the French revolutionists. The monuments were restored by the late king Charles Felix. Matilda, daughter of Amadeus III., married Affonso I., the founder of the Portuguese monarchy.

A.D 1149-1188. Humbert III., called 'the Saint,' son of Amadeus III., succeeded him as count of Savoy and marquis of Italy. He compelled Manfred, marquis of Saluzzo, to acknowledge himself his vassal. During the long wars of the emperor Frederic I. against the Italian communes, Humbert, as great vassal of the empire, at first followed the banners of his sovereign, but afterwards kept aloof from him, and the consequence was that Frederic deprived him of part of his dominions, among the rest of Turin, creating the bishop of that city prince of the empire. Frederic, being irritated against the citizens of Susa, who had risen against him on his passage, burnt the town and castle. A.D. 1174, when the archives of the house of Savoy are said to have perished in the flames. Humbert was fond of religious retirement, and spent much of his time in the abbey of Hautecombe. He died in 1188.

1188-1233. Thomas I. succeeded his father Humbert III. Having acknowledged Philip of Suabia as king of Germany, in preference to his competitor Otho of Aquitania, Philip restored Thomas to all the titles and prerogatives of which his father had been deprived by Frederic I. Thomas purchased of the Viscount Berlion the seignory of Chambéry for 32,000 sols of Susa, equal to 84,200 francs, and enlarged the town and built the castle. Until this time Aiguebelle had been the capital and residence of the counts of Savoy. Thomas enjoyed the friendship of the emperor Frederic II., who appointed him his vicar in Lombardy. The citizens of Turin, instigated by Boniface, marquis of Montferrato, and also by their bishop, refused allegiance to the count of Savoy. Thomas crossed the Alps and laid siege to Turin, but the people of Asti and other parts of Montferrato coming to its assistance, the count was obliged to raise the siege and return to Savoy. In the following year he came again with more force by the Val d'Aosta, but he fell ill and died, in January, 1233. He left a numerous family: three of his sons reigned in succession after him; another, Boniface, became archbishop of Canterbury; and another, Thomas, became count of Flanders by marrying Joan, the daughter and heiress of Baldwin, count of Flanders and emperor of Constantinople.

1233-1253. Amadeus IV., son of Thomas, recovered the dominion over Turin, the bishop and citizens swearing allegiance to him, and he was created by Frederic II. duke of the Chablais and of Aosta. He married one of his daughters to the Marquis of Montferrato, and another to the Marquis of Saluzzo, both old rivals of his house. Amadeus IV. died in 1253, and was buried at Hautecombe. Amadeus gave up to his brother Thomas, count of Flanders, the 'utile dominium' of his Italian states with the title of count of Piedmont, retaining however the suzerainté for himself.

1253. Boniface, the infant son of Amadeus, was placed under the guardianship of his uncle Thomas, count of Flanders. The people of Turin, having revolted again and being supported by the free city of Asti, took Thomas prisoner. When Boniface was of age, he crossed the Alps, and laid siege to Turin, but the Marquis of Montferrato, and Charles, count of Anjou and Provence, who had begun to extend his dominions over part of Piedmont, marched against the Count of Savoy, and took him prisoner. Boniface died in prison at Turin, and left no issue.

1263-1268. Peter, son of Count Thomas I., and uncle of Boniface, born in 1203, succeeded to his nephew. By affinity, he was uncle of Henry III. of England, who had married Eleanor of Provence, daughter of Beatrix of Savoy, Peter's sister. In 1241 Peter had repaired to England, and had been received with great honours by Henry and his consort. Henry made him earl of Richmond, and gave him for his residence a palace near London on the banks of the Thames, which was from that circumstance called Savoy House. Peter was sixty years old when he succeeded his nephew Boniface as count of Savoy. His first care was to reduce the city of Turin, in which he succeeded after a long siege. Peter afterwards returned to England, where Richard of Cornwall, who had been elected king of Germany, bestowed upon him the extensive inheritance of Hartmann, count of Kyburg, styled 'the old,' who had married Peter's sister, and who died without issue in 1264. This inheritance extended along the northern banks of the Leman lake, and through this and the grants of former emperors to Peter's ancestors the house of Savoy became possessed of the whole of that fine county called the Barony of Vaud, afterwards Pays de Vaud, and now the Canton de Vaud in Switzerland. Peter died in the castle of Chillon on the shore of the Leman lake, in 1268, and was buried at Hautecombe. He left only one daughter by his wife Agnes, heiress of the barony of Faucigny. This daughter, Beatrix, made subsequently a donation of that barony to Amadeus V. Peter had a great reputation for wisdom and chivalric gallantry.

1268-1284 Philip I., Peter's brother, succeeded him as count of Savoy in his old age. He had some disputes with Rudolf of Habsburg, king of Germany, concerning the territories of Kyburg, north of the Leman lake, but they were settled by an honourable treaty. He died at the castle of Roussillon in the Bugey, leaving no issue.

1285-1323. Amadeus V., styled the Great, son of Thomas, count of Flanders, succeeded his uncle Philip. He had frequent wars with the dauphin of Vienne and with the counts of Geneva, whom he repeatedly defeated. He gave Piedmont in fief to his nephew Philip, who, having married, in 1304, Isabella of Villehardouin, heiress of the principalities of Achaia and Morea, received the investiture of the same from Charles II. of Anjou, king of Naples and count of Provence. Robert, the successor of Charles, however, aspiring to become master of all Italy, tampered with the citizens of Turin and Asti, and with the marquis of Montferrato, for the purpose of establishing his own dominion over all Piedmont, where the Anjous were already possessed of Alba, Cherasco, Savigliano, and other towns. But Henry of Luxemburg, the newly-elected king of the Germans, coming to Italy in 1310, passed through Savoy, where he was received and splendidly entertained at Chambéry by Count Amadeus, who, with his brother Louis, baron of Vaud, and his nephew Philip, prince of Achaia, accompanied the emperor to Milan, and afterwards to Rome, where he was crowned emperor, in August, 1312. The emperor then made a donation of the city and county of Asti in favour of Count Amadeus. Henry's death, which happened in the following year, prevented Amadeus from enforcing his title over Asti, which was occupied by king Robert of Naples. Amadeus afterwards is said by some chroniclers to have gone to Rhodes, to assist the knights of St. John to defend that island against Sultan Othman, and to have returned home after the Turks had raised the siege. In 1323 he went to Avignon, to induce Pope John XXII. to preach a crusade in order to save the Byzantine empire, which was then in great danger from the Turks, and whose emperor, Andronicus the Younger, married Anna of Savoy, daughter of Amadeus. But Amadeus, who was old, fell ill and died, at Avignon, 1323.

1323-1329. Edward, son of Amadeus, succeeded him. He had to repel the repeated attacks of the dauphin of Vienne, the count of Geneva, and the baron of Faucigny, who were leagued against him. At last, through the mediation of Philip of Valois, king of France, peace was made. The count of Savoy, in 1328, led a body of men to join King Philip against the Flemish, and contributed to the defeat of the latter by the French at Mount Cassel. After the termination of that war Count Edward went to Paris, where he fell ill and died, in November 1329, leaving no male issue.

1330 1343. Aymon, Edward's brother, was proclaimed his successor by the states of Savoy, in preference to Edward's daughter, who was married to the duke of Brittany. The states declared on that occasion, that so long as there were any male descendants or collaterals in the house of Savoy, no female, however near in the direct line, should reign.

Aymon's reign was peaceful, and the count applied himself to improve the administration of Savoy and his other states north of the Alps. He created the office of chancellor as the head of the judicial order, and he also established a supreme council of justice at Chambéry, to hear appeals from the local courts. He decreed, by an edict dated 1336, that any judge in his dominions might be summoned before the assizes to answer charges brought against him by private individuals.

Aymon married Yolande, daughter of Theodore Palæologus, marquis of Montferrato, and son of Andronicus the Elder, emperor of Constantinople. In the marriage contract it was stipulated that the house of Savoy should inherit Montferrato, in default of male issue of the marquis. Aymon died at Montmélian, in 1343.

1343-1383. Amadeus VI., called 'the green count,' son of Aymon, succeeded him. His long reign was eminently successful. He drove away the Anjous from Southern Piedmont; he defeated the marquis of Montferrato, who was eagued against him with the Visconti of Milan; he received the voluntary allegiance of Chieri, Mondovi, and other towns; and he consolidated and greatly extended the dominion of the house of Savoy on the Italian side of the Alps. His other deeds and chivalric adventures are related under AMADEUS VI.

1383-1391. Amadeus VII., styled 'the red count,' from the colour of his armour, succeeded his father Amadeus VI. He soon after proceeded to the assistance of Charles VI. of France against the united Flemish and English, and distinguished himself in several actions. On his return home, he made the important acquisition of the county of Nice, the people of which chose him for their sovereign, A.D. 1388. Then, for the first time, the white cross, the standard of Savoy, floated over the blue waves of the Mediterranean. Amadeus died in 1391, of a fall from his horse, while hunting the boar in the forest of Lornes in the Chablais.

1391-1440. Amadeus VIII., son of the preceding, succeeded his father. His long reign is memorable in the annals of the house of Savoy for his having consolidated and enlarged its dominion on both sides of the Alps, and that mostly by peaceful means. By the extinction of the line of the counts of Geneva, he inherited the county of Genevois, and the suzerainté over the imperial city of Geneva. He purchased the valley of Ossola from the Grisons. [NOVARA, VALLI DI.] He obliged the marquises of Saluzzo and of Ceva to swear allegiance to him; and he obtained of Filippo Maria Visconti, duke of Milan, the cession of the town of Vercelli and its territory west of the Sesia. In 1418, Louis of Savoy, prince of Morea and Achaia, and prince of Piedmont, dying without issue, Amadeus, his next heir, reunited the principality of Piedmont to his other dominions, which thus extended without interruption from the shores of the Leman lake to those of the Mediterranean Sea, and from the Rhône to the Sesia. The emperor Sigismund, on passing through Chambéry, formally created Amadeus duke of Savoy, in 1416, confirming all former investitures granted by his predecessors, and moreover debarring all subjects of the house of Savoy from appealing to the imperial chamber from judgments pronounced by the duke or his successors.

Amadeus VIII. bore the titles of duke of Savoy, Chablais, and Aosta, prince of Piedmont, count of Genevois, Bugey, and Nice, baron of Vaud and Faucigny, and marquis of Italy, and from his time the house of Savoy assumed a distinguished place among the sovereign houses of Europe.

He collected the edicts and statutes of his ancestors, and from them and the 'droit coutumier,' or customs of the Genevois and Faucigny, he compiled a code of laws for all Savoy, under the title of 'Statuta Sabaudiæ,' which he published in 1430.

Other particulars of the life and vicissitudes of this remarkable prince, who assumed for a time the papal tiara, are given under AMADEUS VIII.

1440-1465. Ludovic, or Louis, son of Amadeus VIII. [illegible] sumed the ducal crown in consequence of his [illegible] cation in 1440, when Amadeus was raised to the pa[illegible] Ludovic had married Anna Lusignan, of the roya[illegible] of Cyprus, who exercised a great influence over [illegible] second son, likewise named Ludovic, mar[illegible] heiress of that kingdom, and he was crowned [illegible] in 1458; but he and his wife were soon after dri[illegible] Charlotte's illegitimate brother, and the is[illegible] fell into the hands of the Venetians. [CYPRU[illegible] of king of Cyprus and Jerusalem is still assum[illegible] presentative of the dynasty of Savoy. Lud[illegible] d or restored the university of Turin; he cr[illegible] court of justice for Piedmont, called a Sena[illegible] mitted the barons of Piedmont to the first [illegible] state, which had been till then monopolised by [illegible] ards. Ludovic died at Lyon, in January, 1465, [illegible] ceeding to the court of his son-in-law Louis XI. [illegible]

1465-1472. Amadeus IX., son of Ludovic, su[illegible] He was of a sickly frame, and of a contemplative [illegible] mind, and was little suited to the cares of go[illegible] [AMADEUS IX.]

1472-1482. Philibert, son of Amadeus, succeeded him while yet a minor under the guardianship of his mother Yolande, sister of Louis XI. The duchess sent a body of troops to join the army, with which Charles le Teméraire, duke of Burgundy, invaded Switzerland, A.D. 1476. These troops however almost all perished in the battles of Granson and Morat; and Charles, fearing that the duchess might turn against him in his adversity, gave secret orders to seize her and her children, which was effected by a party of men in ambuscade, who surprised the duchess while she was proceeding to Geneva without any armed escort. A Piedmontese gentleman succeeded in concealing the young duke Philibert, whom he carried to France, to his uncle Louis XI., who soon after sent an armed party to deliver the duchess from the castle of Rouvre, where she was confined by Charles, and he restored both her and her son to their dominions. In 1478 Yolande died; and in 1482 Duke Philibert, being now of age, went to Lyon on a visit to King Louis, but died soon after in that city, leaving no issue.

1482-1489. Charles I., Philibert's brother, assumed the ducal crown, and in November, 1483, made his public entry into Turin. He found himself engaged in a war against the marquis of Saluzzo; but Charles VIII., king of France, interfered, on the plea that the marquis was his vassal, and proposed himself as umpire between the two contending parties. After several years of negotiations, Charles fell ill and died at Pignerol, in March, 1489, being only twenty-one years of age.

1489-1496. Charles John Amadeus, styled Charles II., son of the preceding, was a mere child when his father died. His mother, Bianca of Montferrato, was proclaimed regent, with the assistance of a council. Turin was definitively chosen for the residence of the court. From that time the house of Savoy became really Italian. In 1494 Charles VIII. of France passed through Turin on his march to invade the kingdom of Naples. He was received by the duchess regent with great honours, and she even lent to the king her jewels, as he was in great want of money. In April, 1496, the infant duke died of a fall, at the villa of Moncalieri near Turin.

1496-1497. Philip II., count of Bresse, and a son of Duke Ludovic, succeeded as duke of Savoy and prince of Piedmont; but he died after eighteen months' reign, in November, 1497. He left by Margaret of Bourbon, his first wife, a son, Philibert, who reigned after him, and a daughter, Louisa, who married the duke of Angoulême, and was the mother of Francis I. of France; and by a second wife, Charles, who was duke of Savoy after Philibert.

1497-1504. Philibert II. married Margaret of Austria, daughter of the emperor Maximilian I. The dominions of the house of Savoy, placed as they were between France and the German empire, whose jurisdiction extended over North Italy, rendered the position of the dukes extremely delicate, especially in the long wars which broke out in the sixteenth century between the house of Austria and France. The duke of Savoy had the title of Imperial vicar in Italy, and was by interest as well as duty attached to the Imperial cause. Philibert however allowed Louis XII. of France to pass through his dominions on his way to invade the duchy of Milan in 1799. In 1504 Philibert II. died without issue, and was buried in the convent of Bron at Bourg-en-Bresse, where his monument, with his statue and those of his mother and wife, is still seen.

1504-1553. Charles III., brother of Philibert, although fond of peace, found himself for the greater part of his reign in the midst of the most destructive wars; first between Louis XII. of France and the Holy League headed by pope Julius II. against the French; afterwards between Francis I. on one side, and the Swiss and Duke Sforza of Milan on the other; and lastly between Francis I. and his powerful rival the emperor Charles V.: in all of which the territories of Savoy and Piedmont, though the duke professed neutrality, were devastated without mercy by French, Swiss, and Imperialists.

Duke Charles acted as mediator between Francis I. and the Swiss, and afterwards between Francis and pope Leo X.; but notwithstanding these good offices, Francis, having taken possession of the duchy of Milan after the battle of Marignano, began to covet the territories of the Duke, as they were interposed between France and his Italian conquest, and he purposely picked a quarrel with his uncle. He wrote to him in March, 1518, in an imperious tone, to give him Vercelli as a former appurtenance of the duchy of Milan, the county of Nice as forming part of Provence, and other vexatious demands, and as the Duke demurred, he declared war against him; but this time the Swiss confederation interposed, and Francis became pacified. In 1524, the French having again lost the duchy of Milan, which was occupied by the troops of Charles V., Francis I. marched an army into Italy, passing through the territories of Savoy with the forced assent of the Duke. The battle of Pavia, in 1525, having placed Francis in the power of his rival, the duke of Savoy, together with his sister Louisa, who was regent of France, warmly interposed to obtain the liberation of Francis, who afterwards acknowledged that 'he lay under greater obligations to the Duke than to any other friend or relative,' obligations however which he soon after forgot. In 1530 Duke Charles attended the coronation of Charles V., who treated him with marked attention, giving to his wife Beatrix of Portugal, and her heirs, the county of Asti. Francis pretended to be offended at this, and he sent to Turin the president Poyat to demand of the Duke, Vercelli, Nice, the Bresse, and the Faucigny, in right of his mother, Louisa of Savoy. Poyat appeared before the council of the Duke, and as Porporati, the president of the council, rebutted the claim, offering to show his master's original titles to those territories, Poyat insolently exclaimed, 'Words are useless, the King wills it so;' Porporati replied, 'We have here no code in which the arbitrary will of a king of France is laid down as law.' In 1535 Francis declared war against the Duke, and his troops occupied the whole of Savoy and Piedmont, except a few fortresses which held out for the Duke, who took refuge at Nice. The troops of Charles V. entered Piedmont, and that unfortunate county was for many years the theatre of war between the two great rivals. In 1543 Nice was attacked by a combined French and Turkish fleet; the town was sacked, but the castle was saved by the timely arrival of Andrea Doria.

In 1547 Henri II., having succeeded Francis I., came to Turin to take formal possession of Piedmont. In 1551 war broke out between France and the Emperor, and Piedmont was again the field of battle between the two armies. In the midst of this confusion, Duke Charles died in 1553, at Vercelli, where he had taken refuge under the protection of the Imperial troops. Vercelli, Nice, Aosta, and Cuneo were the only places that still held out for the house of Savoy.

1553-1580. Emmanuel Philibert, son of Duke Charles, had acquired great military reputation in the armies of Charles V., and he continued in the service of his son and successor Philip II., for whom he won the great battle of St. Quentin from the French in 1557, and in the following year he gained the battle of Gravelines. By the peace of Cambresis, between Philip II. and Henri II. of France, it was expressly stipulated that the hereditary dominions of the house of Savoy should be restored to Emmanuel Philibert, who married Margaret of France, sister of Henri II. The Duke, having thus recovered Savoy and Piedmont, which had been estranged from his house for nearly half a century, fixed his residence at Turin, and applied himself to restore order in every branch of the administration. It has been already observed that he may be considered as the real founder of the monarchy of the house of Savoy. The states of Savoy, which had existed in the feudal period, became disused, being no longer convened. The Duke purchased the county of Tenda and the principality of Oneglia, and created a small naval force for the protection of the coasts. But he could not recover either Geneva, which had established its independence in the time of his father, nor the Pays de Vaud, which had been occupied by the Bernese. The Leman lake became the northern boundary of the dominions of Savoy. Emmanuel Philibert died at Turin in 1580, leaving Piedmont in a flourishing condition, very different from that in which he had found it.

1580-1630. Charles Emmanuel I., son of Emmanuel Philibert, married Catherine of Austria, daughter of Philip II., and became attached to the alliance of Spain, which was then the preponderating power in Italy, being possessed of the Milanese, Naples, Sicily, and Sardinia. Trusting to the support of Spain, Charles Emmanuel thought of taking from the French the marquisate of Saluzzo, upon which he had old and legitimate claims. Remonstrances having proved useless, the Duke collected his army, entered the territory of Saluzzo, took the capital, as well as the castles of Revel and Château Dauphin, and the Alps became the boundary between France and Piedmont. France, distracted by civil and religious wars, could not resent the loss at the time, but after the death of Henri III., Charles Emmanuel having taken the part of the League against Henri of Navarre, a desultory warfare was carried on for years on the borders of Savoy and Piedmont, between the troops of Savoy and the partizans of Henri IV. in Dauphiné, led by Lesdiguieres. When Henri IV. was acknowledged king of France, he claimed the marquisate of Saluzzo, and the claim being refused, he invaded Savoy in 1600. By the peace of Lyon of the following year, Saluzzo was definitively given to the house of Savoy, in exchange for the Bresse, Bugey, and the county of Gex, which were ceded to France.

In December, 1602, Charles Emmanuel attempted to surprise Geneva by scaling the walls in the night, but the attempt was discovered in time, and his troops withdrew, leaving behind many killed and prisoners. In the following year, by the treaty of St. Julien, the duke formally acknowledged the independence of Geneva.

Charles Emmanuel was afterwards engaged in a war against the Spanish governor of Milan for the possession of the marquisate of Montferrato, which was terminated by the peace of 1617. The war broke out again in 1625 on account of the affairs of Valtellina, and lastly the disputed succession of Mantova and Montferrato occasioned another war in Italy in 1628, when Charles Emmanuel joined Spain and the emperor against France. The French invaded Savoy and overran Piedmont, and in the midst of this Duke Charles Emmanuel died at Savigliano, in July, 1630.

1630-1637. Victor Amadeus I., son of Charles Emmanuel, obtained possession of the greater part of Montferrato, by the peace of Cherasco, in 1631. In 1635 he was obliged by the threats of Cardinal Richelieu to join the French against the Spanish possessions in Italy. He died in October, 1637, in the midst of the war, leaving two infant sons, the first of whom, Francesco Giacinto, reigned nominally only for one year, as he died in 1638.

1638-1675. Charles Emmanuel II., second son of Victor Amadeus, was proclaimed duke under the regency of his mother Christina of France. French troops, in their quality of allies, were in possession of the greater part of the country, and Cardinal Richelieu, who wished to reduce the dukes of Savoy to the condition of vassals of the crown of France, commanded in Piedmont by means of his generals. In the mean time Thomas of Savoy, prince of Carignano, and Cardinal Maurice of Savoy, uncles of the infant duke, being supported by Spain, demanded for themselves the regency and guardianship of their nephew, in order, as they said, to free the territories of their house from the baneful influence of France. A Spanish army from the Milanese entered Piedmont, led by the two princes, and most of the towns opened their gates to them. Turin was taken by surprise, and the duchess regent escaped to Susa, from whence she repaired to Grenoble, where her brother Louis XIII. then was. But Richelieu, who was more king than Louis, required her son to be sent to Paris, and that the fortresses which were still in her possession should be given up to the French. The duchess returned to Chambéry, and the war between the French and Spaniards continued to rage in Piedmont. In 1640 Turin, being in possession of Prince Thomas and the Spaniards, was besieged by a French army, which had possession of the citadel, and the French were in their turn surrounded in their entrenchments by a Spanish army commanded by Count Leganes. At last Turin capitulated, and Leganes withdrew. The duchess, disgusted with the French, and the princes her brothers-in-law, weary of the Spaniards, came at last to a secret understanding, which was facilitated by the death of Richelieu in 1648. Piedmont was freed of foreign troops, and Charles Emmanuel, being of age, assumed the government, and named his uncle Prince Thomas governor of Asti and Alba, and Prince Maurice lieutenant-general for the county of Nice. The peace of the Pyrenees in 1659 terminated the Italian wars between France and Spain, which had lasted with little interruption for nearly 80 years. Duke Charles Emmanuel enjoyed peace during the remainder of his reign. He applied himself to the improvement of his dominions. Among other things he opened the Pass des Echelles on the road from Chambéry to Lyon, for which purpose a cut was made through the rock for the distance of more than half a mile. He died in 1675, generally regretted.

1675-1730. Victor Amadeus II. succeeded his father Charles Emmanuel. He found himself harassed between Louis XIV. of France on one side and the house of Austria on the other. The imperious Louis sent him commands as if he were his vassal; he ordered him to persecute the Valdenses, to send him several regiments to join his army in Flanders, and lastly to give up to him the citadel of Turin. Victor Amadeus summoned round him the nobles of Piedmont, and declared war against France. Being joined by an Austrian force, he disputed every inch of ground against the French. The war lasted till 1695, when Louis XIV., by fair promises, succeeded in detaching the duke of Savoy from the emperor. The peace of Ryswyck restored peace to Italy, and the French evacuated all the territories of the Duke, including Pinerolo, which they had possessed for about a century. In the war of the Spanish succession Victor Amadeus sided first with the French, but afterwards joined the emperor, because he considered it extremely dangerous for his dominions to allow the house of Bourbon to become possessed of the Milanese and the other Spanish territories in Italy. The consequence was that the French armies again overran and devastated Piedmont, and in 1706 besieged Turin, which made a noble defence. Victor Amadeus, being joined by the Austrian army under his relative Prince Eugene of Savoy, defeated the French besieging army on the 7th September, 1706, and delivered Turin. By the peace of Utrecht, 1713, he obtained the Valsesia, the territory of Lomellina, the remainder of Montferrato, and other districts, and above all the island of Sicily with the title of king, and he was crowned at Palermo, in December, 1713. By the subsequent treaty of London, Victor Amadeus gave up Sicily to the emperor, and received in exchange the island of Sardinia with the title of a kingdom. [SARDEGNA, *History of*.] Thus through his gallantry and perseverance the house of Savoy became numbered among the royal houses of Europe.

Victor Amadeus employed the peaceful period which followed to improve the administration, to recruit his finances, and to encourage agriculture and industry. Through his care the cultivation of the mulberry-tree and the rearing of silkworms attained in Piedmont that perfection which they still maintain. He also reformed the university of Turin and founded several colleges. In 1730 Victor Amadeus abdicated in favour of his son Charles Emmanuel, and retired to the villa of Moncalieri, where he died in 1732. He was distinguished both as a general and a statesman, and was well worthy of being the first king of his dynasty.

King Victor Amadeus was married to Anne Marie of Orleans, daughter of Philip, duke of Orleans, brother of Louis XIV., and of Henrietta Maria, daughter of Charles I. of England. This alliance is the origin of the connection between the house of Savoy and the kings of Great Britain.

1730-1773. Charles Emmanuel III., King of Sardinia, Duke of Savoy, Prince of Piedmont, &c., assumed the crown in times of peace. But the ambition of the court of Spain, excited by Elizabeth Farnese, wife of Philip V., aimed at recovering its lost preponderance in Italy, and Spain was supported by France in consequence of the family alliance. The contested election for the crown of Poland became the pretext for a new war in 1733. The French cabinet, in order to obtain the alliance of the king of Sardinia, promised him the duchy of Milan, which was to be taken from Austria. Charles Emmanuel assented, united his forces to the French army under Villars, and the Milanese was conquered in a few weeks. Don Carlos, Infante of Spain, on his part conquered Naples. In September, 1734, the battle of Guastalla took place between the Austrians on one side, and the French and Sardinian troops, commanded by King Charles Emmanuel, on the other. The Austrians lost 8000 men, and were obliged to retreat. In 1735 the preliminaries of peace were signed, and Charles Emmanuel, instead of the duchy of Milan, obtained only the Novarese and Tortona. This was the last war in which the house of Savoy joined France against Austria.

In the war of the Austrian succession, King Charles Emmanuel took the part of Maria Theresa. He saw that the Bourbons had again become sufficiently powerful in Italy by the acquisition of Naples and Sicily, and it was not his interest to favour their further aggrandisement. His policy and that of his successors was therefore to be allied with Austria and England, and to prevent the French from crossing the Alps. In 1743 the king of Sardinia signed a treaty with Maria Theresa and England, engaging himself to defend Lombardy with 45,000 men. England agreed to pay him a subsidy, and to keep a fleet in the Mediterranean during the war. The French and Spanish combined forces invaded Piedmont by the way of Nice, and laid siege to Cuneo, which they could not take. In 1745 another French and Spanish army, passing the Riviera of Genoa, entered Lombardy, and took Milan. In the following year the king of Sardinia, united with the Austrians, drove them away. In 1747 a French force of fifty batallions, commanded by the Chevalier Belleisle, moving from Briançon, crossed Mont Genevre, and advanced by Cesane and Oulx, to the pass of the Col de l'Assiette, situated between the sources of the Dora and those of the Chisone, where the Piedmontese troops had formed an entrenched camp. The French attacked the camp on the 19th of July; but after the most strenuous efforts, they were completely repulsed, having lost their general, between 400 and 500 officers, and 4000 men. This defeat put an end to all attempts at invading Piedmont for half a century. By the peace of Aix-la-Chapelle the king of Sardinia obtained the upper Novarese, or Valli di Novara, and the districts of Voghera and Vigerano near the Po.

The remaining twenty-five years of the reign of Charles Emmanuel III. were spent in peace, and employed in the cares of administration, in which he was ably assisted by his minister Count Bogino. He published the 'Costituzioni Reali,' or code already mentioned; he effected the 'catasto,' or general survey of the land, in order to put the assessment of the land-tax on an equitable basis; he established special schools of artillery and mineralogy, and sent several learned men on scientific journeys; he opened new roads, excavated canals, gave new privileges to the town of Nice in order to increase its commerce; and in 1771 he published an edict, empowering all individuals and communes to commute the feudal services to which they might be subject, for an equivalent in money, to be fixed by a court created for the purpose. He took off all the extraordinary imposts which had been put on during the long preceding wars, and yet the revenue of the state increased every year. Charles Emmanuel died at Turin, in February, 1773, at 72 years of age, regretted, both by his subjects and foreigners, for his able public conduct and his unspotted private character. He left to his successor a compact and extensive territory, a thriving population, a fine army, and a full treasury.

1773-1796. Victor Amadeus III., son of Charles Emmanuel, showed himself very fond of military parade and exercises, and he increased his army in time of profound peace. The finances became exhausted, the public debt increased, and fresh taxes were laid on the people. The king greatly favoured the nobles, giving to them almost exclusively the public offices, civil, military, and ecclesiastical. At the same time king Victor encouraged useful studies: he reorganised the public colleges and schools [illegible] expulsion of the Jesuits, and he app[illegible]ted fit m[illegible] the chairs of the university of Turin. T[illegible] revolution rendered the end of his reig[illegible] Savoy and Nice in 1792, Oneglia in 1[illegible] years more of a desultory but sangui[illegible] line of the Alps, in which the Pi[illegible] their accustomed valour and disc[illegible] line [illegible] formed by the Alps was turned by the French

h the Ligurian Apennines, and the revolutionary tor-
)ured down into the plains of the Po. [Bonaparte,
,eon.] King Victor was induced to conclude a hasty
which left his dominions at the mercy of the French.
d soon after, in October, 1796.

-1802. Charles Emmanuel IV., son of King Victor,
led his father on a slippery throne. Savoy and Nice
mited to France, and Piedmont was overrun by
troops, who held the principal fortresses in their

As long as Bonaparte remained in command in
ie observed some degree of respect towards the king
inia, but after his departure the generals, commis-
ınd other agents of the Directory heaped insult upon
n the fallen monarch, and exaction on exaction on
'ortunate subjects, until at last he was obliged to
o Sardinia in 1799. The melancholy details of those
re told by the historian Botta, himself a Piedmontese,
most striking language. In June, 1802, Charles
ıuel, who was then at Rome, abdicated the crown in
)f his brother Victor Emmanuel.

-1821. Victor Emmanuel, seeing no chance of being
l to his continental states, repaired to the island of
a. In the year 1814 he returned to Turin, and took
on of the dominions of his ancestors, to which the
ss of Vienna added the Genoese territory. A mili-
urrection, which broke out in Piedmont, headed by
the nobles, who wished for a representative constitu-
th two chambers, whilst another party wanted the
tion of Spain of 1812, with only one chamber, in-
the king to abdicate the crown in favour of his
Charles Felix (he himself having had no male
), who was then at Modena. Victor Emmanuel
Turin with his family, leaving his relative Prince
Albert of Savoy Carignano, a descendant of Prince
, brother of Victor Amadeus I., provisional regent.

1831. Charles Felix, supported by Austria, put down
urrection in Piedmont, and restored the former
f monarchy. He occupied himself with the busi-
administration, and also in making new roads and
nprovements both in his continental dominions and
sland of Sardinia, where he appears to have been
ular. He died at the beginning of 1831, leaving
issue, and was succeeded on the throne by his col-
lative Charles Albert of Carignano, the present king.

llowing are among the best works for reference con-
the history of the Sardinian states: Ludovico della
Storia del Piemonte, libri trè; Agostino della Chiesa,
Reale di Savoia; Paradino, *Chronique de Savoie;*
Origine delle Guerre Civile del Piemonte; Galli,
del Piemonte e Paesi riuniti, colla Serie Cronolo-
'e Persone che le hanno occupate, dal Secolo X. fino
ıbre, 1798; Grillet, *Dictionnaire Historique, Litté-*
Statistique des Départemens du Mont Blanc et du
contenant l'Histoire Ancienne et Moderne de la
Denina, *Quadro Storico, Statistico, e Morale dell'*
lia; Tenivelli, *Biografia Piemontese;* Count Sa-
istoire Militaire du Piémont; Costa de Beaure-
moires Historiques sur la Maison de Savoie et sur
soumis à sa Domination depuis le Commencement
Siècle jusqu' à l'Année 1796; Napione, *Storia Me-*
ella Real Casa di Savoia; and lastly, Count Dal-
no, in his *Essai sur les Anciennes Assemblées Na-*
de la Savoie, du Piémont, et des Pays annexés, 8vo.,
29, has collected much information upon the his-
he old States-General of those countries. At
ent moment Luigi Cibrario, a Piedmontese writer
reputation, author of the 'Storia di Chieri,' is
a general history of the monarchy, *Storia della*
ia di Savoia, of which the first volume has
ely published at Turin, and which promises to
finished, the best work on the subject. The
king, Charles Albert, a great promoter of his-
udies, has caused a collection to be made of the old
s, charters, diplomas, and other documents of the
ges, the first volume of which has been lately pub-
lonumenta Historiæ Patriæ Scriptorum, in fol.

respect to the island of Sardinia, the best modern
e: Manno, *Storia di Sardegna*, 3 vols. 8vo., 1827;
e la Marmora, *Voyage en Sardaigne de* 1919 *à*
h an atlas, Paris, 1826; and Capt. W. H. Smyth,
f the Present State of the Island of Sardinia, to
st we are indebted for most of the information con-
that island.

SARDO'NICUS RISUS, a convulsive affection of the muscles of the face, in which the lips are drawn involuntarily apart, so as somewhat to resemble the expression of the countenance in laughter. The name is derived from a species of ranunculus that grows in Sardinia, called Herba Sardonica, or Sardoa, which is said to produce this affection in those who eat it.

Risus Sardonicus is observed as an effect of certain vegetable poisons, such as the *Ranunculus sceleratus* of Linnæus, but is more frequently met with as one of the symptoms of tetanus, or locked-jaw, or as an attendant on other convulsive affections.

The term is employed figuratively to denote that forced laugh by which persons sometimes endeavour to conceal their real feelings.

SA'RDONYX. [Quartz.]

SAREE. [Persia.]

SAREPTA. [Saratow.]

SARGUS. [Sparidæ.]

SARIGUE. [Marsupialia, vol. xiv., p. 459.]

SARK, or SERK. [Guernsey.]

SARLAT. [Dordogne.]

SARMA'TIA was the name given by the Romans to al. the country in Europe and Asia between the Vistula and the Caspian. It was bounded on the south by the Euxine and Mount Caucasus, and was divided by the Tanais into Sarmatia Europæa and Sarmatia Asiatica. The people inhabiting this country were usually called Sauromatæ (Σαυρομάται), by the Greeks and Sarmatæ by the Romans.

Neither Herodotus nor Strabo makes mention of the European Sarmatians. The Sauromatæ of Herodotus dwelt to the east of the Tanais, by which they were separated from the Scythians of Europe, and inhabited a tract of country extending northward from the Palus Mæotis equal to fifteen days' journey in length. (Herod., iv. 21, 58.) Herodotus also says that the Sauromatæ sprung from the intercourse of a body of Scythians with some Amazons who came from the river Thermodon in Asia Minor, and that their language was a corrupted form of the Scythian (iv. 110-117). Strabo likewise places the Sauromatæ between the Tanais and the Caspian (ix., p. 507, 492), and speaks of the people west of the Tanais as Scythians.

The principal nations in European Samatia were—1, The Venedæ or Venedi, on the Baltic. 2, The Peucini, or Bastarnæ, in the neighbourhood of the Carpathian Mountains, who, as well as the Venedi, appear to have been of German origin. (Tac., *Germ.*, 46.) 3, The Iazyges, Rhoxolani, and Hamaxobii, in the southern part of modern Russia. 4, The Alauni or Alani Scythæ, in the central part of Russia, in the neighbourhood of Moscow. The knowledge which the antients possessed of these people was very small; they are universally represented as a nomade people with filthy habits. The people with whom the Romans were brought most in contact were the Iazyges, generally called Iazyges Sarmatæ, and sometimes Iazyges Metanastæ, because they were driven out of their original seats on the Euxine and the Palus Mæotis about the year 51 A.D. They settled in the country between the Danube and the Tibisis or Tibiscus (Theiss), after driving out the Daci, and carried on for a short time war with the Romans. (Plin., iv. 25; Tac., *Ann.*, xii. 29, 30.) They are frequently mentioned by subsequent writers as dangerous neighbours to the provinces of Pannonia and Mæsia.

The different tribes in Asiatic Samatia never acquired any historical importance.

There are some valuable remarks on the history of the Sarmatians in Niebuhr's 'Kleine Schriften,' p. 352, &c.

SARNO. [Salerno.]

SAROS, NEROS, SOSOS. These names are from the fragments left of Berosus, who says that the Chaldæans had three astronomical periods so called, the saros of 3600 years, the neros of 600 years, and the sosos of 60 years. Of the two latter we know nothing more, and as to the saros, the duration given by Berosus is either entirely wrong, or else subsequent writers have taken another Chaldæan period, which is neither of the three above, and applied the term saros to it. Geminus (ch. 15) mentions that the Chaldæans had found a period of 669 months, or 19,756 days (so the text stands after an emendation by Bouillaud). Ptolemy mentions the same period, and Pliny (lib. ii., c. 13) remarks relative to it, that eclipses return again after a period of 223 (the third of 669) months; but the text here again was corrupt, until Halley (*Phil. Trans.*, No. 194) restored the true reading, which was afterwards confirmed by manuscripts. To complete the misfortunes of this period, Suidas has the word Saros, but it was omitted from his Lexicon either by mistake or faultiness of manuscripts, until Dr. Pearson restored it (*Exp. of the Creed*, 1683, fol. 59, according to Weidler), and even then it gives 222 months instead of 223, which was again corrected by Halley. In the time of Riccioli, Geminus and Ptolemy were the authorities cited on this period, and the name Saros was not applied to it. Many writers (Costard for example) confound it with the Metonic period of 235 lunations, which is a totally different thing: others again, as Geminus, and even Riccioli, appear to consider it as a period for the determination of the lunation or month; and perhaps the assertion made by some others, that the Chaldæans were in possession of the Metonic cycle, may be another confusion between the latter and the saros.

Leaving the authorities on the subject, we know [MOON, p. 373] that 223 average intervals between full moon and full moon make up very nearly 242 nodical months, or passages of the moons from one node to the same again. Now since the eclipses entirely depend upon the manner in which the full and new moons take place relatively to the node, it is obvious that if 223 lunations were exactly 242 nodical months, and if the sun's and moon's orbits were truly circular, and their motions uniform, all the eclipses of one set of 223 lunations would be produced again precisely in the same order during the next 223; that is, if there were (say) an eclipse of the sun during the 47th lunation, reckoning from a given full moon, there would necessarily be another in the (47 + 223)rd, or the 270th lunation, and so on.

All these suppositions are near enough to the truth to make this sequence of eclipses very nearly take place. For since 223 lunations make 241·029 sidereal months, 238·992 anomalistic months, and 241·999 nodical months, it is obvious that at the end of a saros the moon is in the same position with respect to the sun, nearly in the same part of the heavens, nearly in the same part of her orbit, and very nearly indeed at the same distance from her node as at the beginning of the period. Now 223 lunations make 6585·32128 days, or 6585 days, 7 hours, 42 minutes, and 38 seconds; or 18 years (of 365 days), 15 days, 7 hours, 40 minutes, and 38 seconds. Consequently a saros of five leap years is 18 years, 10¼ days, and one of four leap years is 18 years, 11¼ days, nearly. The Chaldæan period is 6585⅓ days; and to avoid fractions they appear to have put together three such periods, making 19,756 days, and 669 lunations. From what has been said above, it might be inferred that the rotation of the moon's node is made in nearly a saros; and in fact that revolution does take 18·6 years.

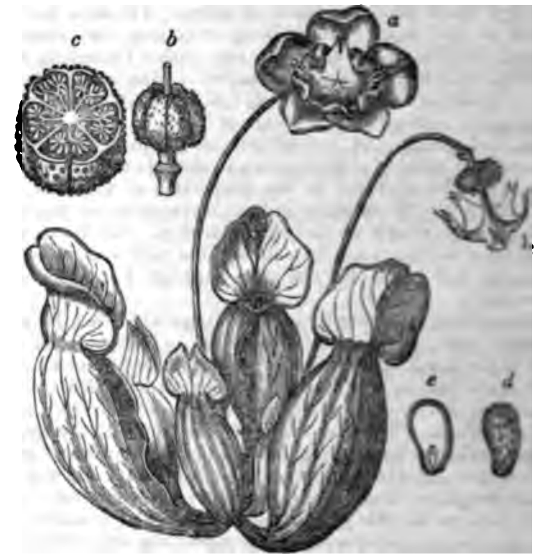
It is to be observed however that the end of each saros is not in the same part of the day as the beginning, which is of consequence as to the solar eclipses, though not so as to the lunar, and still more does the inexactness of the period affect the former. For a saros contains 241·998659 mean nodical revolutions; so that if the moon be in her node at the beginning of a saros, she will want ·001341 of a revolution of being in her node at the end of it. This is about 29′, nearly the moon's diameter, which makes it sometimes happen that a lunar eclipse which takes place in a certain lunation of one saros does not take place in the same lunation of the next, and very often causes the same as to a solar eclipse. And the effect must be that at last the eclipse of any lunation is destroyed, by the accumulation of these errors of 29′ each time. Nor do the circumstances of one saros precisely resemble those of another until a longer period of about 746 such periods has elapsed. But in the same manner that eclipses are removed out of one lunation by the inexactness of the period, they are carried into another. There are about 70 eclipses in each saros, 30 lunar and 40 solar.

The Metonic cycle of 235 lunations gives 255·021 nodical months, which is not near enough to a whole number to produce anything like a return of similar eclipses. But it is, as explained [MOON, p. 373], near enough to an exact number of years to restore the full moons to the same days of the year, or the preceding or following days. The Metonic cycle is a chronological period; that is, portions of time measured from a given epoch, and each equal to 19 years, are used in chronology. But the Saros is not a chronological period, but only a portion of time with any arbitrary commencement. Hence the student must not look in works on chronology for any information upon it. (Riccioli, *Alm. Nov.*; Weidler, *Hist. Astron.*; Bouillaud, *Astron. Philol.*; Ferguson's *Astronomy*.)

SAROS. [HUNGARY.]

SARRACENIA′CEÆ, a natural order of plants placed by Lindley in the albuminous group of polypetalous Exogens. It consists of herbaceous perennial plants inhabiting bogs, with fibrous roots and radical leaves, with a hollow urn-shaped or pitcher-shaped petiole, at the point of which is articulated the lamina, or blade of the leaf, which covers the petiole like a lid. The flowers are solitary or on scapes, and the petals and sepals are herbaceous. The calyx is composed of 5 persistent sepals, often having a 3-leaved involucre without, imbricate in æstivation. Corolla of 5 petals, unguiculate and concave. The stamens are hypogynous and indefinite, filaments short, anthers 2-celled, bursting longitudinally. Ovary superior, 5-celled, with a central many-seeded placenta; style single; stigma much dilated, peltate with 5 angles. Fruit a globose capsule, with 5 lobes, 5 cells, and 5 valves. Seeds very numerous; albumen abundant. The affinities of this order are not very obvious. It is usually placed near Papaveraceæ, on account of its dilated stigma, indefinite stamens, and embryo in the midst of a copious albumen. Lindley considers it to be related to Dionæa [DIONÆA], wherever that genus may be ultimately placed. In the remarkable structure of the leaves this order agrees with Nepenthaceæ and Cephalotaceæ.

There is only one genus belonging to this order, of which there are about six species, all of them inhabitants of the bogs and swamps of North America. Of their properties we know but little; they are chiefly interesting on account of their pitcher-like leaves, which are capable of holding water, and are thus said to furnish drink to wild animals in their native forests during periods of drought. The pitchers frequently contain the dead bodies of flies and other insects, which become putrid and produce an unpleasant smell around the plant, but are said to afford to the plant a source of nutrition.



Sarracenia purpurea.

a, Entire plant with leaves and flowers; 1, the dilated stigma; *b*, ovary with columnar style; *c*, transverse section of fruit, showing seeds attached to parietal placentæ; *d*, seed; *e*, section of seed, showing the minute embryo and abundant albumen.

SARRALBE. [MOSELLE.]
SARREAU. [MORBIHAN.]
SARREGUEMINES. [MOSELLE.]
SARRU′BA, or SARRUBUS. [GECKO, vol. xi., p. 163.]
SARSAPARILLA. [SMILAX.]

SARSAPARILLA, EAST INDIAN, a root used in medicine, and sold by druggists as a substitute for sarsaparilla, under the above name. This is imported from India, and has been said by some to be the produce of Smilax aspera, a plant not known to be found within the limits of that country. Species of Smilax are however common in India, but are not described as being employed by the natives in medicine. Dr. Royle (*Proc. R. Asiatic Soc.*, June, 1836) states having received a portion of this root, which had been brought from India by Mr. Dodd, and that he obtained

ns of an exactly similar root at Godfrey's, London,
e name of Smilax aspera. On consulting the works
ie, Roxburgh, and a figure of Rheede, he found that
corresponded in every respect with that of Asclepias
arsa, now Hemidesmus Indicus, which by the natives
Nunnari-vayr, and by Europeans in India 'country
lla.' The roots are long, slender, and have a plea-
ur, often compared to that of oris-root. It is rugose,
cortex often loose, furrowed longitudinally, and
transversely into ring-like pieces. It has been long
nsively employed by the natives of India for much
purposes as sarsaparilla, whence European practi-
ere induced to give it a trial; and having been found
is, it has continued to be employed in the hospitals.
n was first drawn to it in this country by Dr. Ash-
in 1831, who says it increases the appetite, acts as
c, and improves the general health,—plumpness,
, and strength succeeding to emaciation, muddiness,
ility. It has also been employed by other prac-
, who have spoken favourably of it; and as it is
t and cheap, it seems worthy of introduction into
practice.

'HE, a department in France, taking its name
of the streams by which it is watered, the Sarthe,
nt of the Mayenne (which below the junction is
aine), belonging to the system of the Loire. The
nt is bounded on the north and north-east by that
on the east by those of Eure et Loir and Loir et
the south by those of Indre et Loire and Maine et
nd on the west by that of Mayenne. Its form is
ly compact, approximating to that of a circle,
ts chief town, Le Mans, nearly in the centre. Its
om north to south, from the banks of the Sarthe
Mêle (department of Orne) to the border of the
nt of Indre and Loire, near Château la Vallière,
stimated at 62 miles; its greatest breadth from east
rom the neighbourhood of St. Calais to the bank of
below Baillé, is about 58 miles. The area is esti-
2407 square miles, being very near the average
he French departments, and rather exceeding the
areas of the English counties of Hants and Berks.
ulation in 1831 was 457,372; in 1836, 466,888;
an increase in five years of 9516, or above two per
d giving 194 inhabitants to a square mile. In
nd density of population it exceeds the average of
ch departments in the proportion of about six to
is a little superior in both respects to the English
with which we have compared it. Le Mans, the
n, is 111 miles in a direct line west-south-west of
122 miles by the road through Versailles and

rface is generally level. There are a few hills in
parts, but none of any height. The principal are
ie north-western border, about Sillé-le-Guillaume.
h-east side of the department is occupied by the
is of the cretaceous group which environ the chalk
Paris. The line which defines the outer edge of
nations passes northward from the southern boun-
he department between Le Lude and La Flèche
eighbourhood of Le Mans, west of that town; it
s north-east to the neighbourhood of Bonnetable,
turning east-south-east crosses the Braye into the
nt of Loir et Cher. From beneath the cretaceous
ie formations between the chalk and the new red-
crop out, and occupy the remainder of the de-
, except along the north-western boundary, where
stratified or the granite rocks of the great primi-
ict of Bretagne make their appearance. Some of
rities speak of coal as produced in the department,
ever works existed appear to have been given up.
re in 1834 three pits of anthracite, which yielded
above 18,000 tons, and gave employment to above
. Iron is procured; and there were in 1834 five
s, with five furnaces for producing pig-iron, and
forges for making wrought-iron; charcoal was the
ost exclusively employed. Freestone for building,
specially fine black, sandstone for paving, slates,
s, granite, and fullers' earth are found. There are
ieral waters, but none in much repute.

partment belongs wholly to the basin of the Loire.
cipal river is the Sarthe, which touches the border
partment on the north side near Alençon, and flowing south-west separates it from the department of Orne, except near Alençon, where its course is beyond the boundary, to which however it soon returns. Several miles above Frênay, or Fresnay-le-Vicomte, it quits the border and flows in a winding channel south-east to Le Mans, just below which it receives the Huine on the left bank from the north-east. From the junction of the Huine the navigation commences, and the river flows south-west into the department of Maine et Loire. Its whole course on or within the border of this department may be estimated at 110 to 120 miles, for about 50 of which it is navigable. The Loir, a tributary of the Sarthe, crosses the department just within the south-eastern and southern border, from between Montoire (department of Loir et Cher) and La Chartre to between La Flèche and Durtal (department of Maine et Loire): it does not join the Sarthe in this department. Its course in this department may be estimated at about 55 miles, for 35 or 40 of which, viz. from Château-du-Loir, it is navigable. Beside the Huine and the Loir, the Sarthe receives the Bionne and the Orne on the left bank; and the Geay, the Vègre, the Erve, and the Vaige on the right. The Loir receives the Braye, the Elangsort, and the Orne on the right bank; the Huine receives several small streams. The rivers abound in fish; the Huine and its affluents yield excellent trout.

The official statement of the inland navigation of the department is as follows:—

Sarthe	52	miles
Loir	46	„
Total	98	

There are no navigable canals.

There were, 1st January, 1837, seven Routes Royales, or government roads, having an aggregate length of 248 miles, all in good repair. The principal road is that from Paris to Nantes, which enters the department on the north-east side, and passes through La Ferté Bernard, Connerré, St. Mars, Le Mans, and La Flèche. Roads run from Le Mans by Beaumont-le-Vicomte to Alençon (department of Orne); to Laval (department of Mayenne); by Ecomoy and Château-du-Loir to Tours (department of Indre et Loire); and by Bouloire and Saint Calais to Blois (department of Loir et Cher). A road from Laval to Tours passes just within the south-western boundary of the department, through Sablé, La Flèche, and Le Lude; and one from Alençon to Orléans (department of Loiret) passes just within the northern border through Mamers. The departmental roads had an aggregate length of 219 miles, viz. 199 miles in good repair, and 20 miles unfinished. The bye-roads had an aggregate length of 7000 miles.

The climate is mild and healthy. The soil varies much. The part occupied by the formations of the cretaceous group presents little else than a succession of sands. Part of this tract is made by care to yield good crops of grain, and other parts have been turned to account by planting them with the maritime pine (*pinus maritima*) as in the Landes of the south-west coast. The rest of the department has a tolerably productive soil. The area is estimated at about 1,550,000 acres, of which nearly 1,000,000 acres, or almost two-thirds, are under the plough. The principal grain crop is of wheat; but oats, buckwheat, and maize are also grown, and rye in the sandy districts. A considerable quantity of hemp and flax is raised, and a great quantity of trefoil seed, of which there is a large exportation, partly to England and partly to the North of Europe. The meadows and grass-lands occupy nearly 150,000 acres, and there are above 110,000 acres of heath or open pasture. The number of horned cattle is considerable; some of them are of a particular race which will carry a great deal of fat: sheep are numerous; the merinos are bred. Poultry and game abound; the former are an object of great attention round La Flèche, and are sent in great numbers to the markets at Paris. Bees are generally kept. The vineyards occupy about 25,000 acres; but the produce is for the most part of very inferior quality: the best growths are those of Les Janières, Chabaignes, and Bazouges, on the banks of the Loir. The orchards and gardens occupy as great an extent as the vineyards. Cider is the common drink of the people, but it is neither so pleasant nor does it keep so well as that of Normandie. A considerable quantity of fruit is grown, and some is exported. The chesnuts of Château-du-Loir are reputed to be excellent. The woodlands occupy about 170,000 acres.

The department is divided into four arrondissements as follows:—

Name.	Situation.	Area in Sq. Miles.	Cantons.	Communes.	Population in 1831.	Population in 1836.
Le Mans .	Cent. & W.	733	10	116	157,851	164,667
Mamers .	N.	622	10	144	131,867	133,444
Saint Calais	E.	432	6	56	71,334	70,834
La Flèche .	S.	620	7	78	96,320	97,943
		2407	33	394	457,372	466,888

In the arrondissement of Le Mans are—Le Mans, population in 1831, 19,672 town, 19,792 whole commune; in 1836, 23,164 commune [MANS, LE]; La Guierche and La Suze, on the Sarthe; Ballon, population 4078, near the Orne; Connerré and Montfort, on the Huine; St. Mars-la-Bruyère, on the Narais, an affluent of the Huine; Savigné, on the Coeslon, another small affluent of the Huine; Ecomoy or Ecommoy, population 3499, near the Orne, an affluent of the Loir; Vallon, on the Geay; Loué, on the Vègre; and Sillé-le-Guillaume, population 1917 town, 2696 whole commune; and Conlie, between the Vègre and the Sarthe. La Suze is on the left bank of the Sarthe, over which there is a handsome bridge. Close to the town are the ruins of the castle, formerly occupied by the lords of the place. The townsmen are engaged in the manufacture of wax-lights, hats, and poultry; and carry on a brisk trade in wood, woollen cloth, liqueurs, and hardwares: there are six yearly fairs. Ballon is remarkable for the ruins of an antient castle, which, from its situation on the top of a hill, forms a conspicuous object in the landscape: it was antiently one of the strongholds of Maine, and was taken, A.D. 1199, by Philippe Auguste. The townsmen manufacture coarse linen, in which, and in corn, they carry on considerable trade. Connerré has two remarkable druidical monuments. One is a cromlech formed by a slab or block of sandstone, about 2 feet thick, supported by five other blocks, forming three sides of an irregular quadrangle of more than 20 feet long and 8 to 10 feet wide. The other monument is an upright stone or obelisk, about 12 feet high above the ground, 8 feet broad, and on an average 2 feet thick. The blocks are all rough. The town of Connerré is small, but pleasantly situated in the meadows watered by the Longuève, a little stream which here joins the Huine, and over which, at the entrance of the town, is a good stone bridge. Montfort, distinguished from other places of the same name as Montfort-le-Rotrou, is on the slope of a hill, the summit of which is crowned by an old castle, whose massive walls render it at a distance a striking object. The townsmen are engaged in the manufacture of linen, which they excel in bleaching; and carry on trade in corn, hemp, yarn, and linen: there is a large market and four yearly fairs. There is an hospital in the town. The linen manufacture is also carried on at Savigné, distinguished at Savigné l'Evêque; that of paper at St. Mars. Ecomoy is a busy place: excellent butter is made, and building-stone and limestone are quarried and potters' earth is dug round the town; there are brick-yards, lime-kilns, and potteries; the townsmen manufacture linen. The church has a beautifully modelled equestrian statue of St. Martin. At Vallon, Loué, and Sillé-le-Guillaume linens are manufactured, and trade in corn is carried on: Sillé-le-Guillaume has an antient castle.

In the arrondissement of Mamers are—Mamers, population in 1831, 5720 town, 5822 whole commune; in 1836, 5704 commune, between the Bienne and the Orne; Fresnay-le-Vicomte, population 2775 town, 2840 whole commune; and Beaumonte-le-Vicomte, population 1918 town, 2381 whole commune, on the Sarthe; Bourg-le-Roy, between the Sarthe and the Bienne; La Férte Bernard, population 2535, on the Huine; Saint Côme and Bonnétable, population 3872 town, 5803 whole commune [BONNETABLE], between the Orne and the Huine; and Montmirail, near the Braye. Mamers was antiently fortified, and was taken in the eleventh century by the count of Belême, and afterwards by the Normans; but there are now scarcely any traces of fortifications. The town is irregularly laid out, and consists of two large places or squares, with a number of streets adjacent to or terminating in them; neither streets nor squares are paved. The houses are tolerably well built, chiefly of stone. The smaller of the two is occupied by a handsome covered market; the ot[illegible] large building, formerly a convent, now con[illegible] offices of the sub-prefect and the mayor, the [illegible] high school, the public library, the theatre, the [illegible] the barrack of the gendarmes. There are public [illegible] The townsmen are engaged in the manufacture [illegible] linens, in which 1600 persons in and round the [illegible] occupied, and of calico, which gives emplo[illegible] more. Hosiery is also made; and there are [illegible] tan-yards. Great trade is carried on in corn, wine, [illegible] wax, cattle, and especially sheep, which are [illegible] yield excellent mutton. There are five c[illegible] fairs in the year. Near the town is an [illegible] cribed by some to the middle ages, by [illegible] Cæsar. Fresnay, or Frênay-le-Vicomte, has a [illegible] erected of late years, and a museum of stuffed [illegible] townsmen are considered to manufacture the [illegible] linens sold at Paris as Alençon linens; and tw[illegible] them are supported by this branch of industry. [illegible] six yearly fairs for cattle and linen. [illegible] origin and its distinctive epithet to the [illegible] Le [illegible] Mans, who had a castle here, of which the remain[illegible] a prison. It is probably to one of these nobles th[illegible] ascribe the artificial earthen mound which [illegible] the town, and which has been planted and [illegible] walks winding to the summit, like the [illegible] John [illegible] Canterbury. The townsmen manufacture [illegible] and prunella. The market, which is held in [illegible] ket-place, with a market-house, is well attended; [illegible] fat geese are sold. There are several vineyards [illegible] town, but they do not prosper. La Ferté [illegible] scene of a conference in 1189, between Henry [illegible] land and Philippe Auguste of France. It was also [illegible] taken by Philippe: it was again taken, A.D. 1424, [illegible] English, under the earl of Salisbury; and in the [illegible] Henri IV., A.D. 1590, by the prince of Conti. [illegible] whose population is augmented by that of the [illegible] which are comprehended in the adjacent c[illegible] nearly 4000, has a small but handsome pa[illegible] Gothic architecture, a promenade, and an [illegible] old walls of the town remain; and there is a c[illegible] keep and towers in pretty good preservation. The [illegible] manufacture is of coarse checked linens for the [illegible] linen-bleaching is also carried on; there are [illegible] and tan, flour, and fulling mills. There is a w[illegible] market, and much business is done in trefoil see[illegible] fattened in the surrounding meadows, and in infe[illegible] and tolerable cheese. There are seven fairs in [illegible] There is a public library. Saint Côme is a ple[illegible] in a delightful situation. Roman medals have [illegible] up here. Montmirail is on a hill: it has considerab[illegible] works for making utensils for chemical and [illegible] poses. The townsmen trade in iron: they [illegible] in the year.

In the arrondissement of Saint Calais are—[illegible] pop. in 1831, 2864 for the town, or 3638 for the who[illegible] in 1836, 3783 for the commune, not far from the [illegible] of the Braye; Vibraye, pop. 3037, and Bessé, on [illegible] La Chartre, and Château-du-Loir, pop. 2752 [illegible] whole commune, on the Loir; Grand-Lucé, on th[illegible] which flows into the Elangsort; and Bouloire or [illegible] on the Tortue, which joins the Longuève, or L[illegible] feeder of the Huine. Saint Calais was antiently call[illegible] from the name of the brook on which it stands, until it received its present name, derived from a Saint Calais who founded a monastery here in the sixth century. The town lies in a hollow, amid hills covered with scanty crops of corn: it has an interesting Gothic church and a spire, two pub[illegible] walks, one of them by the side of the brook, and a large place or square. The inhabitants manufacture serge and other woollens, cottons, linens, leather, and glass: they carry on trade in cotton goods and trefoil seed. There are a subordinate court of justice and a high school. Near the town are the ruins of an old castle. Vibraye has an iron-work, a tan-yard, and an hospital. Much corn and many p[illegible] are sold in its market, and it has seven yearly fairs. A[illegible] Bessé, cotton goods, wax candles, and paper are made. Château-du-Loir gets its name from an antient castle [illegible] the counts of Anjou, erected in the eleventh century and demolished in the eighteenth. The older part of the town is badly laid out, and is composed of steep, narrow, and [illegible] streets; but the new street, along which the road from :ans to Tours passes, is straight and composed of neat houses with gardens; it traverses a handsome and ar square, planted with trees and serving as a public on the site of the antient castle, Near the town, on overlooking the valley of the Loir, is a singular fau-, or suburb, consisting not of houses, but of caves ved out in the rock in two rows, one above the , and inhabited by above a hundred families, linen-ers chiefly, but some vine-dressers and labourers. are at Château-du-Loir an hospital, a theatre, public , and a college. Linens, leather, and cotton yarn are ifactured; cattle, wood, corn, and wine are sold: there onsiderable weekly market; and there are six yearly La Chartre consists of one principal street, opening in art into a small place or square, and of some smaller ts running into the principal one. Some of the poorer itants live in caves, similar to those of Château-du-Loir, not so pleasantly situated. Near the town are two ids, the earthworks apparently of an antient castle. nhabitants tan leather, and trade in wine and cattle; have six considerable yearly fairs. Grand Lucé was lt after a dreadful fire in 1786; much trade in corn attle is carried on. Coarse linens are manufactured at ire.

the arrondissement of La Flèche are—La Flèche, pop. 31, 5970 town, 6421 whole commune; in 1836, 6440 iune; Le Lude, pop. 2182 town, 3250 whole commune; aas, on the Loir; Pontvallain and Mansigné, on or the Orne; Noyen, Malicorne, Parcé, and Sablé, pop. town, 3999 whole commune, on the Sarthe; Précigné, en the Loir and the Sarthe; and Brulon, on the Végre.

èche is agreeably situated in the pleasant valley of oir. It consists of three principal streets, two of them el to each other running through the town for the ice of about half a mile, and the third at right angles m; together with a few smaller streets or lanes. The arallel streets are straight, wide, and well paved; the rom Paris by Le Mans to Angers and Nantes passes gh one of them: the other is partly lined by the exten-uildings of the military school. The places or squares nall. The principal public buildings are the town-hall, ifice of regular design, which remained for some time erhaps still remains incomplete. The parish church bles a village church: there is a pleasant promenade ent to it. The royal military school occupies a royal built by Henri IV., and afterwards bestowed by him e Jesuits for a college. On the suppression of the s, in 1762, it was converted by Louis XV. into a mili-chool; and after being suppressed at the Revolution, evived by Louis XVIII. Prince Eugene, Descartes, he astronomer Picard were educated here while the ts had the place. The buildings are arranged round ourts; the principal of which, with its adjacent garden, y handsome. The principal gateway is adorned with tured ornaments and a bust of Henri IV. There is large park, which is embellished by the running water ht from two or three miles distance for the supply of uilding. There are about 600 pupils, 400 of them sup-l by the government. There is a handsome chapel in istitution, and there are a library of 9000 volumes and lery of paintings. The town has a theatre and two c bathing establishments. The trade of La Flèche is reat; it consists chiefly in the corn, hay, wine, poultry, game of the neighbourhood; the two last are sent to , where they are much esteemed for their delicacy. Black for nuns, leather, and glue are made. There are twelve fairs. This town was repeatedly taken and retaken in eligious wars of the sixteenth century, and was also at a period the scene of contest between the republican and ean armies. There are the ruins of an old castle of the l lords of La Flèche. Le Lude consists of well-built es, but the streets are very irregularly laid out. It is com-led by an antient castle, whose massive quadrangular , situated on an eminence overlooking the Loir, and ed by enormous round towers, one of them in ruins, pre-a striking appearance. The park in which the castle ls was stocked with fine timber, now partially or wholly l. There is a small hospital in the town. The inhabit-carry on a considerable trade in leather, and have eight y fairs, one of them for leather and two for cattle. Vaas i small square planted with trees; the townsmen manu-ire leather; there are four yearly fairs. The town was, before the Revolution, under the jurisdiction of the abbot of a Premonstratensian abbey founded in the reign of Charlemagne. At Pontvallain trade is carried on in cattle and swine; at Malicorne earthenware, pottery, and tiles are made; at Parcé paper is manufactured. Sablé was antiently a place of strength, but its fortifications have been entirely demolished. The streets are narrow and crooked; there is a small but pleasant boulevard raised like a terrace along the bank of the Sarthe, which forms a semicircular bend round the town. There is a bridge over the river, built of marble quarried near the town, which, though in its rough state of a slate colour, becomes of a deep black with veins of white when polished. There is a handsome mansion near the town, built in the beginning of the last century, but allowed to go to decay. A considerable manufacture of gloves, which are sent to Paris, is carried on; and there is considerable trade in corn, fruit, and the marble quarried near the town. There are four fairs in the year. At Précigné, or Pressegné, is a tolerably well frequented mineral spring; the town has a manufacture of coarse woollen cloth, and there are two fairs in the year. Leather is made at Brulon.

The population, where not otherwise noticed, is that of commune, and from the census of 1831.

This department, with that of Mayenne, constitutes the diocese of Le Mans, the bishop of which is a suffragan of the archbishop of Tours. It is in the jurisdiction of the Cour Royale and of the Académie Universitaire of Angers; and in the fourth military division, the head-quarters of which are at Tours. It sends seven members to the Chamber of Deputies. In respect of education it is considerably below the average of France. In every hundred young men enrolled in the military census of 1828-29, only thirty could read and write, the average of the French departments being above thirty-nine.

The department was in the earliest historic period chiefly included in the territories of the Aulerci Cenomani (*Αὐλίρκιοι οἱ Κενομανοί*, Ptol.); small portions just on the border were probably included in the territories of the adjacent tribes; the Arvii (*Αρούϊοι*, Ptol.), on the west, the element of whose name appears to have been preserved in that of the river Erve; and the Andes, or Andecavi (*'Ουδικάναι*, Ptol.), and Turones (*Τουρούπιοι* in some MSS. of Ptol., *Τούρονοι* in another), on the south. These were all included in the Roman province of Lugdunensis Tertia. The only antient town which is known to have been within this territory is Suindinum (Subdinnum, Tab. Peutinger; *Οὐινδινον*, Ptol.), afterwards Cenomani, now Le Mans; there is a position, 'Fines,' in the Peutinger Table, which D'Anville places just on the border of the adjacent dioceses of Le Mans and Chartres. In the division of France into provinces, this department was included in Maine, except the southern border, which was included in Anjou; it was the scene of frequent hostilities in the middle ages, during a short period of which it formed part of the extensive Continental territories of the Anglo-Norman princes. It suffered considerably during the Vendean war which followed the French Revolution.

SARTI, GIUSEPPE, a composer, once in high repute, and whose name is still too familiar to the readers of musical history to be omitted here—though his works, like most that are written to suit the fashion of the day, are, with the exception of a sacred terzetto, consigned to oblivion — was born in 1730, at Faenza. In 1756 he became *Maestro di Capella* at the court of Copenhagen: he afterwards composed for the court of Dresden; and finally entered into the service of Catherine of Russia, who treated him with a liberality truly imperial, at whose demise he was continued in all his appointments and emoluments by Paul, her successor. His *chef-d'œuvre*, '*Giulio Sabino*,' an opera, which was extravagantly applauded abroad, and is highly spoken of by Dr. Burney, did not succeed in London; indeed the neglect into which it speedily fell here, and, in time, everywhere else, may be adduced as a proof of its inherent weakness, and of the want of that power in the composer which is apparent in most of his works that are known to us. Sarti produced about thirty operas, and some sacred music. Of the latter, the terzetto alluded to above, 'Amplius lava me,' is well known and deservedly admired. He died at Berlin, in 1802.

SARTO, ANDREA VANUCCHI, called *del Sarto*, from the occupation of his father, who was a tailor, was born at Florence in 1488, and having shown an early predilection for drawing, was placed with a goldsmith to learn the business of engraving or plate. Being noticed by Giovanni Barile, a painter of no great celebrity, he persuaded his father to entrust his son to his care. With him young Sarto remained three years, and manifested such extraordinary talent that Barile placed him with Pietro Cosimo, who was considered one of the best painters in Italy. On leaving the school of Cosimo he formed an intimacy with Francisco Bigio, with whom he executed some works in the public buildings of Florence, which gained him considerable reputation. Lanzi observes that his improvement was not so rapid as that of many other artists, but slow and gradual. It has been erroneously asserted that he never was at Rome, but we are assured by Vasari that he passed some time in that city. We are informed that it was after his return from Rome that he painted for the monastery of the Salvi his admired pictures of the Descent of the Holy Ghost, the Birth of the Virgin, and the Last Supper. Of the last, Lanzi reports, that at the siege of Florence in 1529, the soldiers, after having destroyed the church and part of the convent, when they entered the refectory, stood motionless before it, and had not the heart to demolish it.

Francis I., king of France, desiring to procure specimens of the works of the most distinguished painters in Italy, Andrea del Sarto was commissioned to paint a picture for his Majesty, and sent in a Dead Christ, with the Virgin, St. John, and other figures, painted in his best manner, which is now one of the chief ornaments of the Gallery of the Louvre. This picture being universally admired, the king invited the artist to Paris, where he was received with great distinction, and obtained considerable employment both from Francis and the nobility. Amidst this success he received a letter from his wife, urging him to return to Florence. He accordingly requested leave of absence for a few months, promising to return with his family and settle in France. The king granted his petition; and not only made him liberal presents, but entrusted him with large sums of money for the purchase of statues, pictures, and drawings. Andrea however, on returning to Florence, squandered away the whole of the king's money as well as his own. At last he was reduced to poverty; and his conscience reproaching him with his ingratitude to his royal benefactor, he sunk into despondency, was abandoned by his wife and the false friends with whom he had spent his property, and at last his afflictions were ended by the plague, which carried him off in 1530, in the 42nd year of his age.

The churches, convents, and palaces of Florence contain many of his best works. Andrea is praised by Vasari as the prince of the Tuscan school, for having committed fewer faults than any other Florentine painter.

His colouring is distinguished by sweetness and harmony of tone; and he is remarkable for the boldness of his relief and his perfect knowledge of chiaroscuro. His draperies are easy and graceful, and his design extremely correct. Yet he seems to have wanted the grandeur which characterises the greatest masters.

SARUM. We propose under this head to give an account of Old Sarum, and a notice of the bishopric now fixed at New Sarum, or Salisbury. [SALISBURY.]

Old Sarum, situated about a mile and a half north of Salisbury, is generally regarded as the Sorbiodunum of the Romans. Its name, derived from the Celtic words *sorbio*, 'dry,' and *dun*, 'a city or fortress,' leads to the conclusion that it was a British post; it probably belonged to the Belgæ, who inhabited this part of Britain, and was perhaps one of the towns taken by Vespasian when engaged in the subjugation of this part of the island under the emperor Claudius. [BRITANNIA, vol. v., p. 442.] The number of Roman roads which met at Old Sarum, and the mention of the place in the Antonine Itinerary, show that the place was occupied by the Romans, but the remains present little resemblance to the usual form of their posts. The roads led to Calleva Atrebatum, now Silchester; to Venta Belgarum, now Winchester; to Durnovaria, now Dorchester; and to the shore of the Bristol Channel.

In the Saxon times, Sarum, under the somewhat altered name of Searobyrig, Serasbyria, and Sarisberia, is frequently noticed by historians. Kenric, son of Cerdic, defeated the Britons in this neighbourhood, A.D. 552; and in 1003 the place was taken and burned by Sweyn, king of Denmark. Under the Anglo-Saxon and Anglo-Norman princes, councils ecclesiastical and civil were held here, and the town became the seat of a bishopric. There was a castle or fortress, which is mentioned as early as the time of Alfred, and which may be regarded as the citadel; and the city was defended by a wall, within the enclosure of which the cathedral stood.

Early in the thirteenth century the oppression of the castellans, or captains of the castle, and their disputes with the bishops and clergy, led to the removal of the cathedral to its present site. Many or most of the citizens also removed, and the rise of New Sarum [SALISBURY] led to the decay of the older place: so that in the time of Leland there was not one inhabited house in it. It returned members to parliament 23 Edward I., and again 34 Edward III., from which latter period it continued to return them until it was disfranchised by the Reform Act. It was commonly referred to as the most striking instance of a rotten borough, continuing to return members when it had neither house nor inhabitant.

The earthworks of Old Sarum are very conspicuous. They are on the right of the road from Marlborough to Salisbury, and consist of a circular or rather oval entrenchment; a smaller entrenchment of similar form within the first; and some earthen banks extending from the inner to the outer entrenchment, and subdividing the area between them. The outer entrenchment, consisting of a vallum or rampart surrounded by a ditch, encloses an area of twenty-seven acres and a half: the outer circumference of the ditch is just above seven furlongs, or nearly one mile. From the bottom of the ditch to the top of the rampart the height is 106 feet. The height of the rampart of the inner enclosure, measured in a similar way, is about 100 feet. There are a few fragments of walls. The outer enclosure has two openings or entrances; one, defended by a hornwork, towards the east, the other towards the west. The inner enclosure has only one entrance, namely towards the east. (Sir R. C. Hoare's *Antient Wiltshire.*)

The diocese arose from that of Sherborne, which was formed, in the reign of Ina of Wessex, by dismemberment from the diocese of Winchester, previously the only one in Wessex. In the early part of the tenth century, the diocese of Sherborne was divided into three; and the bishop of one of these had his seat successively at Ramsbury, not far from Marlborough, at Wilton, and perhaps at Sunning in Berkshire. In the time of Bishop Herman, in the reign of Edward the Confessor, this diocese and that of Sherborne were united, and the seat of the bishop fixed at Old Sarum, from whence, as already noticed, it was removed to Salisbury.

The diocese, before the late alterations, comprehended the counties of Wilts and Berks, the former comprehending the archdeaconries of Salisbury and Wilts, and the latter the archdeaconry of Berks. These were divided into thirteen rural deaneries, as follows: I. Archdeaconry of Salisbury—1, Amesbury; 2, Chalk; 3, Pottern; 4, Wilton; 5, Wylye. II. Archdeaconry of Wilts—6, Avebury; 7, Marlborough; 8, Cricklade; 9, Malmsbury. III. Archdeaconry of Berks—10, Abingdon; 11, Newbury; 12, Reading; 13, Wallingford.

By the recommendation of the Church Commissioners the following changes have been made or are to be made. The whole archdeaconry of Berks is transferred to the diocese of Oxford; and the deaneries of Cricklade and Malmsbury, in the archdeaconry of Wilts, to that of Gloucester. On the other hand, the archdeaconry of Dorset, comprehending the five rural deaneries of Bridport, Dorchester, Pimperne, Shafton, and Whitchurch, has been added from the diocese of Bristol. The number of archdeaconries is still three, that of rural deaneries twelve.

The cathedral clergy consist of the dean, precentor, chancellor of the church, treasurer, six canons residentiary, who are also prebendaries, sub-dean, succentor, thirty-eight prebendaries, and four priest-vicars; besides singing-men, choristers, organist, and other officers. The net yearly revenue of the bishopric, on the average of three years ending with 1831, was 3939*l.*, but it was supposed that on a more extended average it would amount to 5000*l.* or from that to 6000*l.* per annum. It is not proposed by the commissioners to make any alteration in this respect. The revenue of the cathedral at the same period averaged 2799*l.*, and was expected to decrease; the corporation sharing this revenue consisted of the dean, who received two-eighths, and six canons, who received one eighth each. The dean, chancellor, precentor, treasurer, and prebendaries had their separate revenues, and the four priest-vicars formed a corporation by themselves.

SARZA'NA. [SPEZIA.]

SARZEAU. [Morbihan.]

SASSAFRAS, the name of a genus of plants belonging to the natural order Lauraceæ. This is one of the genera into which the old genus Laurus of Linnæus has been divided by Nees von Esenbeck and other botanists. It is known by its diœcious flowers, 6-parted membranous calyx, with equal segments permanent at the base. The barren flowers have 9 stamens in 3 rows, the 3 inner with double-stalked glands at the base; the anthers linear, 4-celled, with their faces turned inwards. The fertile flowers have sterile stamens, which are fewer than or as many as in the barren flowers. The fruit is succulent, placed on the thick fleshy apex of the peduncle, and seated in the torn unchanged calyx. The leaves are deciduous; flowers yellow. The species of this genus most known is the *S. officinale*, the Sassafras Laurel, on account of its medicinal virtues. It is an inhabitant of the woods of North America, from Canada to Florida. It is mostly a small tree or bush, but sometimes attains the height of 40 or 50 feet. Its flowers are arranged in naked downy racemes, which open before the leaves appear, and are furnished with subulate deciduous bracts. The leaves are membranous, bright-green, smooth above, finely downy beneath, very variable in form, and tapering in a wedge-like manner into the petiole. The fruit is of a bright blue colour, as large as a small cherry, and seated upon red clavate peduncles. In America the sassafras is divided into two varieties, the red and white. Its great use is for medicinal purposes. It is however employed in America for making bedsteads and other articles of furniture, which are not liable to the attacks of insects, and give out a very agreeable odour. This plant is interesting in connection with the history of America, as it is said that it was its strong aromatic smell that convinced Columbus, when seeking the New World, that a shore was near at hand, and encouraged him to persevere, at a time when his crew had mutinied, and the failure of attaining the objects of his expedition was threatened. This tree has been grown in Great Britain, and in some instances has attained great height and grown luxuriantly. It may be propagated by cuttings of the roots or suckers, and should be planted in a sheltered situation. Its foliage is best when grown against a wall.

A species of Magnolia, the *M. glauca*, is called in America the Swamp Sassafras, and the Sassafras nuts of the London shops are, according to Humboldt, the produce of the *Nectandra Puchoryminor.*

SASSAFRAS, Medical Properties of. The tree which yields this substance is the Sassafras officinale (Nees) (Laurus Sassafras, Lin.); a native of North America, occurring from Canada to Florida. It is said to grow in Mexico, and Martius mentions it as a part of the Materia Medica of Brazil; but it is probable that it was introduced from Florida. The root is the officinal part in the London Pharmacopœia; but the whole plant possesses the aromatic odour common to the Laurineæ, and some assert that the bark of the stem and branches is stronger than that of the root; but this seems to be an error. The root, invested with the bark, comes to Europe in pieces sometimes two feet long, and from the thickness of an arm to half a foot in diameter, irregularly bent, knotty, and with a light, soft, porous wood. The bark also occurs detached from the wood in pieces two or three inches long, from one and a half to two inches broad, sometimes rolled outwards, but more generally curved inwards; of a dirty grey or brownish colour externally, and a fungoid surface, of a reddish colour internally. The taste is sharp, acrid, aromatic, and, as well as the odour, resembles fennel.

The chief constituents are: volatile oil, resin, and extractive. The oil is the most active. It may be obtained by distillation. Ten pounds of the root yield two and a half drachms. The specific gravity is 1·094. It consists of two oils, separable by water, in which the one floats and the other sinks. By time or a low temperature, it deposits a stearopten, or crystals of sassafras-camphor.

Sassafras acts as a stimulant to the circulation, especially of the capillaries, causing an increased secretion from the skin, if the person be kept warm, or from the kidneys, if cool. Should these organs fail to be influenced by it, heat and general excitement, with headache, are the results. It is of unquestionable utility in gout and rheumatism, but its activity is generally destroyed by the improper mode of administering it. Decoction dissipates the volatile oil, and is a most objectionable preparation. Infusion or a tincture may be used, or the volatile oil rubbed up with sugar. Other species of Sassafras are used in India and Java.

SASSA'NIDÆ. [Persia—*History.*]

SA'SSARI. [Sardegna.]

SATELLITE (*satelles*, an attendant soldier or guard), a name given to the smaller planets which accompany and revolve round the larger ones. With this exception, that the rotation of a satellite round its own axis is made in the same time as its orbital revolution round its primary, in every case in which it has yet been fully made out that there is a motion of rotation, there seems to be no circumstance which can be pointed out in which the satellites have any distinctive peculiarities. Those of Uranus (which move from east to west) even form an exception to what would otherwise be the universal law of the bodies of the solar system, namely, that they move from west to east. The earth has one satellite [Moon], Jupiter has four, Saturn seven, and Uranus six (according to William Herschel), though owing to the difficulty of seeing them, two only have yet been seen by any other observer: this point is further treated in Uranus. See also Gravitation, Solar System, Astronomy, Galileo, Huyghens, Cassini, Herschel, &c.

SATERLAND, a district in the grand-duchy of Oldenburg, comprises the three parishes of Scharrel, Ramsloh, and Strücklingen, with a population of about 2000 inhabitants. This little tract forms a plateau surrounded by impassable morasses, over which there has hitherto been no road and scarcely a path. It is situated on two rivers, the Markä and the Ohe, which unite at Scharrel, and then, under the name of Sater-Ems, run north-west through the country to the Söste. It is 12 miles long, 5 broad, and is surrounded on all sides, except the river, with marshes and heaths. In very dry weather it is possible to enter it from East Friesland on horseback and in light carriages, though this is attended with considerable difficulty. On the other side the ground is not firm, except in the severest frost. The inhabitants, who are all of Frisian descent, still speak their mother tongue and likewise the Westphalian dialect. From their secluded situation, they have retained the manners of their ancestors, and are in this respect a very remarkable people. Their country is watered by the Sater-Ems, which facilitates their communication with East Friesland, whither they send their superfluous produce for sale, and receive in return the few articles which they require. They cultivate rye and buckwheat, which thrive very well in their sandy soil. They have oxen, sheep, and cows, considerable turf-moors, but no wood, and only here and there an isolated fruit-tree. They are exempt from game-laws, which is a very profitable privilege on account of the number of wild-fowl. They employ themselves in knitting stockings, and manufacture most of their clothes from the wool of the sheep; all of them are likewise free to exercise the trades of brewing, baking, and distilling, and also to fish without paying for a licence. At the haymaking season, the morasses are crossed in very light waggons with broad wheels not hooped with iron, and the horses have pieces of board attached to their feet, to prevent them from sinking in. The country is governed by twelve burgomasters, four from each of the three parishes; half of them go out every year, and choose their successors, who must not be related to them by consanguinity, and whose appointment is confirmed by the people. This takes place in a general assembly of the inhabitants, held every year, on Shrove Tuesday, at Ramsloh, in the church of which the archives are kept.

SATIN. [Silk.]

SATIN SPAR, *Carbonate of Lime, Fibrous Arragonite* (?). Structure fibrous, the fibres parallel, usually waved, and always transverse to the vein in which the mineral occurs. Like arragonite in general, it is harder than common calcareous spar. Colour white, sometimes yellowish or greyish. Translucent. Specific gravity 2·7. It occurs at Alston Moor in Cumberland, and North America, in tabular masses of an inch or two in thickness, in veins in slaty clay and shale. It consists chiefly, if not altogether, of carbonate of lime.

SATIRE is properly a species of Roman poetry, and must not be confounded with the Satyric drama of the Greeks. The Latin word *Satura* or *Satirâ* appears to have originally signified a collection of various things, and accordingly this name is applied to food composed of various ingredients, and also to a law consisting of several distinct particulars of a different nature. (Festus, *s. v.*; Diomed., iii., p. 483, ed. Putsch.) The Roman satire is first mentioned as a kind of dramatic performance (Liv., vii. 2), and appears to have been, like the early Atellanæ Fabulæ, only a rude improvisatory farce, without dramatic connection, but full of raillery and wit. This species of composition arose from the practice, which has prevailed in Italy from the earliest times to the present day, of the country people making rude extempore verses in ridicule of one another at various festivals, and especially at the time of the vintage. Such were the Fescennini verses, which Macrobius tells us (*Saturn.*, ii. 4) were sometimes written as satires upon persons. The old dramatic Saturæ continued to be performed on the Roman stage till a late period, under the name of Exodia, which were laughable interludes in verse, and were performed between the different Atellane plays. (*Dictionary of Greek and Roman Antiquities*, art. *Exodia.*)

The name of satire was afterwards limited to a species of poetry peculiar to the Romans, in which Ennius is said to have been the first writer. The satires of Ennius appear to have been so called because they were written on a variety of subjects, and in many different metres; but as hardly any fragments have come down to us, we know very little of the subjects of which they were composed. Lucilius however was the first who constructed satire on those principles of art which were considered in the time of Horace as essential requisites in a satiric poem. Lucilius principally used the hexameter metre, which was afterwards almost exclusively employed by the satiric poets. His poems were not only satires upon the vices and follies of mankind in general, but also contained attacks upon private individuals. They formed the model on which Horace wrote his satires; but the circumstances of the times prevented Horace, even if he had the inclination, from attacking eminent political charaters, as Lucilius had done. His own easy temper and happy disposition, as well as the principles of the Epicurean philosophy, led him to attack the foibles and follies of mankind in a style of playful raillery, which forms a striking contrast to the severe invectives of Juvenal. The increased corruption of morals at Rome under the early emperors, and the cruel punishments which had been inflicted by Domitian upon the wise and the good, naturally led Juvenal to attack the vices of his age with severity and vigour. The works of the other Roman satirists are lost, with the exception of Persius and a few verses on the banishment of the philosophers by Domitian, which are ascribed to Sulpicia, who is supposed by some writers to be a contemporary of Tibullus, and by others of Ausonius. A of list modern authors on the subject of the Roman Satire is given in the article Rome, p. 115.

SATISFACTION, in Law, is said to exist where a party, having a right of action, accepts from the party against whom he has it, a certain and valuable thing, or the performance of a certain and beneficial act, in lieu of his right of action. If the action is afterwards brought, the satisfaction may be pleaded in bar of it. Satisfaction may exist as to actions in which damages are recoverable, and as to some others (Blake's case, 6 Co., *Rep.*, 44; Peytoe's case, 9 Co., *Rep.*, 78); but it cannot operate so as to dispense with the performance of a covenant under a deed, by reason of the rule of law that a deed can only be made void by an instrument of the same nature, and therefore implying the same degree of deliberation. Though where a right of action upon the deed has vested, in consequence of some wrong or default occurring subsequent to the execution of the deed, as in the case of a breach of covenant to repair, to pay rent, &c., there may be satisfaction. The satisfaction, to be valid, must have been accepted by the party who has the right, and must have proceeded from the party who is liable.

Nothing which is paid or done to a third party, or proceeds from him, can operate as a satisfaction. It must also be certain, that is, definite as to time, &c., and available; thus where the satisfaction is by a mutual agreement, it must be such an agreement as an action may be maintained upon. It must be valuable; by which it is understood not only that there can be no satisfaction consequent of a thing which has no value, as, for instance, a rush; but also that the value must be at least not obviously inferior in amount to that for which it is given, such as a payment of a less sum of money at the same or a subsequent day as that on which a greater is due. Although if there are advantageous circumstances attendant on the payment of a less sum, a payment before the day when the larger is due, or at
another place than that where it is payable, this
rate as satisfaction. But the giving of a horse
may be a satisfaction of a claim for a sum of money
cepted as such, though the horse or statue be in
less value than the money.

A negotiable instrument may operate as a
a debt; and if the party who accepts it, by his
gence fail to recover upon it, the debtor will
continue discharged. The performance must be
executed; a mere endeavour, or a readiness to perfo
as a tender of money, or a part performance, canno
as a satisfaction. It must be beneficial; thus where
made a forcible entry on the lands of another, it
satisfaction for the wrongful entry to permit that
re-enter. In an action for trespass and taking
mere redelivery of the cattle is not a satisfaction,
their conveyance to another place, and redelivery the
be so. The benefit also must be one partak
shape of a pecuniary character. It must eithe
or capable of being measured by money. Thus a
sion before certain persons made in pursuance of th
of a court-martial, or an acknowledgement of the
and prayer for forgiveness kneeling, though a satisfa
honour, is not such satisfaction as to deprive the part
right to damages. The thing must be given or
accepted in lieu of the right of action; otherw
not be a good satisfaction. Satisfaction to one of
plaintiffs is a bar to all; and satisfaction by one joint
doer discharges the others. (Com., *Dig.*, tit. 'Accor

SATRAP (*σατράπης*) was the name given to the
of a province of the Persian empire. He was appoi
the king, and was responsible alone to him. Such a
of government has always existed in the large Asia
pires; but the advantage which the Persian system
many others of a similar kind, was the careful se
made between the civil and military powers. The
nors of the garrisons and the commanders of the troo
independent of the satraps, and responsible only
king. The duties of the satraps are briefly defi
Xenophon to consist in governing the inhabitants, re
the tributes, paying the garrisons, and attending to
ever else is necessary. (*Cyrop.*, viii. 6, § 1-3.) In th
times of the Persian empire, it became the custom
point the satraps to the command of the troops als
cially if they were members of the royal family.
manner the younger Cyrus was appointed satrap of
the western provinces of Asia Minor, and at the sa
general of all the forces which assembled in the
Castolus. (Xen., *Anab.*, i. 1, § 2.) The practice of
the civil and military powers in one person tended
mote revolt among the satraps, and to prepare the
the internal dissolution of the empire. The great
the command entrusted to some satraps was also da
to the royal power. An instance of this kind o
early as the time of the first Darius, in the case of
who was governor of Phrygia, Lydia, and Ionia, and
powerful that Darius dared not proceed openly aga
(Herod. iii. 127.) Subsequently this practice be
more frequent; Cyrus had the command of the g
of the western provinces of Asia Minor; and a
death, Tissaphenes was allowed to hold them
his own. From this period we frequently read of
the satraps, and many of them became quite inde
of the king of Persia. (Heeren's *Asiatic Nations*,
p. 417-26.)

The word satrap is evidently of Persian origin
etymology is not certain. Bohlen (*Das Alte Indien*,
p. 21) supposes it to be only another form of
that is, the lord or master of the kshatriyas, or warri
name of the warrior caste of the Hindus. But this ety
is opposed to what has been stated above, namely
satraps were civil and not military officers. Malcolm
tory of Persia, vol. i., p. 271) supposes it to be ano
of *Shattrapatti*, 'an umbrella-carrier;' while other
writers connect it with the Sanscrit *kshetra*, a plain (
to inhabit), and the Persian *shehr*, a city (Pott, E
gische Forschungen, p. lxviii.); but none of these
gies are satisfactory. In the Book of Esther the satra
Persian empire are called *Achashdarpenim* ([illegible]
from the singular *Achashdarpan*, which Gesenius
Lex.) appears to consider rightly as merely an
writing the word satrap or *kshatrap*, as

nation of Chaldee nouns; and the *a* prefixed to the causes it to correspond to the *Exatrapes* (ἐξατράπης), is used by Theopompus instead of satrapes.

ITARA, or SATARA, a city of Hindustan, the l of the small state of Sattara, is situated in the pro- of Bejapore and district of Moritzabad, in 17° 40′ N. id 74° 3′ E. long., 57 miles south from Poonah in a it line. Sattara is a small town on a rocky and preci- mountain, with a fortress of great strength, and a ome palace built by the raja since he came under the tion of the British. The Mahratta ancestors of the it raja were deprived of their power by the Peshwa in The British however captured Sattara in 1818, and ed it and the territory to the raja. A notice of these ctions and of the limits of the territory is given in the BEJAPORE; see also MAHRATTAS.

TURATION. When common salt, or indeed most saline and many vegetable bodies, are added to water t ceases to dissolve them, the solution so obtained is l a saturated solution of the substance dissolved.

ıration may exist with regard to one body and not to r; thus water saturated with common salt will still e sulphate of soda, and *vice versâ;* so also a saturated n of common salt will dissolve sugar. There are other cases in which the point of saturation may be ined by the cessation of solution; if, for example, ate of lime or carbonate of lead be added to dilute acid, no more of these substances is dissolved than is te to saturate the nitric acid; and the solutions pro- when excess of these bodies remains unacted upon, are . saturated solutions of nitrate of lime or nitrate of

there are other cases in which saturation cannot be ined by insolubility; as when both bodies are em- in a fluid state, or when the excess of a solid body le in the water which holds the saturated salt in so- if, for example, we add carbonate of potash in powder e nitric acid, it will for some time continue to dissolve acid with effervescence, owing to the expulsion of c acid in the gaseous state; and when this efferves- eases, we may consider the solution as consisting of of potash, or nitric acid and potash, in which the on has been mutual; but the carbonate of potash, the carbonate of lime, is soluble in water, and hich holds the nitrate of potash formed in solu- capable of dissolving it. In these cases the point ration is determined by the use of papers stained ferent vegetable colours; if, for example, too much ite of potash should have been added to the nitric saturate it, its presence will be indicated by turning oloured yellow with turmeric, brown; while, on the ınd, excess of acid is in general ascertained by paper blue with litmus, which is rendered red by the of acids.

ıese means a very important process in the manu- of soap and glass is conducted; it is termed *alkali-* ınd employed for ascertaining the strength of dif- samples of the carbonates of potash and soda, so used in glass and soap making. Sulphuric acid di- a known extent is added to the alkaline solutions, en they affect neither blue nor yellow paper, the on is perfect, and the purity and strength of the ıre determined. The saturating power of bodies is y cases greatly influenced by heat, while in others of temperature produces but little effect; thus cold vill take up nearly as much common salt as hot but sulphate of soda is more soluble in hot water cold, and hence it is that a saturated hot solution of l many other salts deposits crystals on cooling. ter, on the contrary, dissolves more lime than hot, turated solution prepared with water at about 32° early twice as much lime in solution as one prepared and when the cold prepared solution is heated, deposited. This however is a case of much rarer ıce than the contrary one.

JRDAY. [WEEK.]

JRN, the name of one of the old planets, the largest ie bodies of the solar system, except the sun and

The planet itself is of a spheroidal figure, the axis ıtion being to the equatorial diameter in about the on of 11 to 12. It is accompanied by two rings of tter, unconnected with the planet and each other, lving round the former; these, not being usually called satellites, are, we suppose, to be considered as parts of the planet, though the former denomination would perhaps be more correct. There are also seven satellites, of which and the rings we shall presently speak more at length. There are also, as in Jupiter, certain thin zones or belts on the surface of the planet, though they ar not always seen.

The apparent equatorial diameter, at the mean distance from the earth, is about 16″·2: the real diameter, that of the earth being 1, is 9·982, or about 79,000 miles, which gives a bulk of about 995 times that of the earth. The mean density is about ·55 of that of the sun, or one-eighth of that of the earth; and the mass of the planet is about 1-3512th of that of the sun. It revolves on its axis in ·428 of a day, or 10 hours, 29 minutes: its equator is inclined to the ecliptic at an angle of 31° 19′. Its light and heat are to those of the earth as 11 to 1000.

Elements of the orbit of Saturn.

Epoch 1801, January 1, 12^h mean astronomical time at Greenwich.

Semiaxis major, 9·5387861, that of the earth being assumed as the unit.

Excentricity, ·0561505; its secular diminution (or diminution in 100 years) ·000312402.

Inclination of the orbit to the ecliptic 2° 29′ 35″·7; its secular diminution 15″·5.

Longitudes from the mean equinox of the epoch: (1) of the ascending node 111° 56′ 37″·4; its secular increase (combined with the precession) 3070″; (2) of the perihelion 89° 9′ 29″·8; its secular increase (combined with the precession) 6950″; (3) of the planet (mean) 135° 20′ 6″·5.

Mean sidereal revolution in 365¼ days 43996″·13; sidereal revolution 10759·2198174 mean solar days.

The first six satellites move nearly in circular orbits (though that of the sixth is said to be sensibly elliptical) round the planet, their circles being exactly (or very nearly) in the plane of the planet's equator, which is also that of the rings. The seventh satellite, which is much the largest (and which is known, by William Herschel's observations, to revolve on its axis in the same time as its revolution in its orbit) moves more nearly in the plane of the ecliptic than in that of the planet's equator, and has a sensibly elliptical orbit. This is all that is known; for while on the one hand the difficulty of seeing the satellites so as to get good measures has prevented an accumulation of proper observations, the ring on the other hand presents by its attraction a new disturbing force, the complete effects of which, in the absence of sufficient observations, it has not been thought worth while to trace.

The farthest satellite but one, and also the largest but one (now called the sixth), was the first discovered, by Huyghens, in 1655. As soon as the five last satellites were discovered, and until the time of Herschel, they were called the first, second, &c., in the order of their distances from the planet. This old nomenclature was gradually abolished after the discovery of a sixth and a seventh satellite by Herschel, being in reality the first and second in order of distance. Some confusion however has ensued in various places: thus, in the article ASTRONOMY (pages 535 and 536) it is said that Cassini discovered the first and second satellite, and also that Herschel did the same: both assertions are true, inasmuch as Cassini discovered what were the first and second satellites (now the third and fourth), and Herschel discovered what immediately became the first and second satellites in right of their position. The following table contains all the comparisons requisite to correct this confusion:—

Satellites of Saturn.

Order in dist. from planet	Order of discovery.	Antient Nomenclature	Sidereal revolution in mean solar days.		Mean distances, equatorial semidiameter of planet being 1.	Date of discovery	Discoverer.
			d. h. m.	*d.*			
1	5	..	0 22 38	or 0·94271	3·351	1789	W. Herschel.
2	5	..	1 8 53	.. 1·37024	4·300	1789	W. Herschel.
3	4	1	1 21 18	.. 1·88780	5·284	1684	D. Cassini.
4	4	2	2 17 45	.. 2·73948	6·819	1684	D. Cassini.
5	3	3	4 12 25	.. 4·51749	9·524	1672	D. Cassini.
6	1	4	15 22 41	.. 15·94530	22·081	1655	Huyghens.
7	2	5	79 7 55	.. 79·32960	64·359	1671	D. Cassini.

The rings are solid circular bodies, rounded, it would seem, at the edges, and two in number, having a motion of revolution round their centres, which is completed in ·428 of a day, or 10 hours, 16 minutes; about 13 minutes less than the rotation of the planet itself: this is also the table in which a satellite would revolve at the same distance from the planet as the middle part of the ring. Sir John Herschel gives the following as the result of Professor Struve's observations and his own:—

Exterior diameter of exterior ring = 176418 miles
Interior „ „ = 155272 „
Exterior diameter of interior ring = 151690 „
Interior „ „ = 117339 „
Equatorial diameter of the body = 79160 „
Interval between the planet and interior ring . . . = 19090 „
Interval of the rings . . = 1791 „
Thickness of the rings not exceeding 100 „

Several observers have seen concentric black lines on the outer ring, as if it consisted of several rings; but neither W. Herschel, Sir J. Herschel, nor Professor Struve, with the most powerful instruments, could detect these lines. The question is a curious one, because if it were the consequence of a telescopic defect, it is difficult to say why the *external* ring only should exhibit these appearances. Captain Kater sums up this question ('Mem. Astron. Soc.,' vol. iv., p. 387) in the following manner: 'From the observations which have been given in the present paper, we may deduce the following conclusions:—

'That the exterior ring of Saturn was observed by Short to be divided into three or four concentric rings.

'That Professor Quetelet, in December, 1823, at Paris, with an achromatic telescope of ten inches aperture, saw the outer ring of Saturn divided into two concentric rings.

'That on the 17th December, 1825, the outer ring of Saturn appeared to me to be made up of at least four rings, the widest interval being in the middle. That on the 16th and 17th January, 1826, I again remarked these divisions of the exterior ring.

'That these divisions were also observed by a friend who was with me on the 17th December, 1825, but who did not remark that one division was stronger than the others.

'That another friend, who was with me on the same evening, and who is very shortsighted, saw the stronger division, but could not perceive the others. I think it will be allowed that the evidence here given goes far to establish the probability of the outer ring of Saturn being composed of several concentric rings. On the other hand it appears that Sir William Herschel, Mr. Herschel, and Mr. Struve, though observing with very superior instruments, could perceive no such divisions as those which I have described.

'On the 22nd January, 1828, the evening being perfectly favourable, I again examined Saturn with great care for several hours, but no divisions of the outer ring were then perceptible.

'It has been remarked by Sir William Herschel, by Mr. Struve, and by most persons who have observed Saturn, that the exterior ring is much less brilliant than the interior: may not this want of light in the outer ring arise from its having a very dense atmosphere: and may not this atmosphere, in certain states, admit of the divisions of the exterior ring being seen through it, though under other circumstances they remain invisible. With respect to the form of the edge of the inner ring of Saturn, next to the planet, the appearance under favourable circumstances is such as to leave no doubt on my mind of its being rounded.'

The physical theory of the rings is curious as having been one of the points in which theory outstripped observation. Supposing the figure of Saturn a perfect spheroid, and the rings to be perfectly concentric with the planet, and perfectly regular in figure, it is obvious that the attraction of the planet would never disturb the system, since it would draw all sides equally towards the centre. But let the slightest disturbance take place, that is, let the centre of the rings be thrown in the smallest degree out of that of the planet, and one side begins to be drawn more forcibly towards the planet than the other, and this effect must continue and become stronger, until at last the ring is thrown upon the planet at one point. Laplace showed that it was essential to the stability of this system that the centre of the rings, instead of being fixed in that of the planet, should describe a small orbit; that is, that the rings should have a slight oscillating motion to and from the planet combined with an oscillating motion of their planes; and observations have shown that such is the case. (Sir J. Herschel, *Astronomy*, p. 284.)

The phenomena of the rings to an inhabitant of [illegible] northern hemisphere of the planet must be as [illegible] when the sun is on the northern side of the equator, a [illegible] of luminous arches must be visible, extending from [illegible] to horizon. At the equator, only the thickness of [illegible] will be seen extending over head from east to [illegible] going from the equator towards the north pole [illegible] will gradually rise and set farther south, but [illegible] thickness will increase, and its greatest altitude [illegible] At about 40° of north latitude, the lower arch [illegible] become a luminous segment of an ellipse, the top of which will become lower and lower until, at 50° or thereabouts, the higher arch will have become only a segment; and a few degrees more of north latitude will make it vanish altogether. But in the south latitudes, the ring will not shine at all while the sun is north of its plane, except in a portion of its thickness; while those who are in the shadow of the rings will not see the sun at all, sometimes for several years. For many days together, in certain situations, the only day will be the emergence of a part of the sun from the ring for a short time.

To an inhabitant of the earth, the phenomena of the rings are as follows:—They are projected into an elliptical form, of which a portion is sometimes hidden behind the planet; when this is the case, the shadow of the planet is seen on the ring. When the sun is in the plane of the ring, which happens twice in every Saturnian year, the edge only of the ring is enlightened, and it can only be seen in the very best telescopes: the next arrival of this disappearance is in December, 1847. As the sun (and with it the earth) leaves the plane of the rings, the latter appear to open, and the opening continues during a quarter of the Saturnian year; when the opening is widest, the longer diameter appears about double of the shorter one. The north or south side of the ring is seen, according as the sun is north or south of its plane.

SATURNA'LIA, a festival celebrated by the Romans in honour of the god Saturnus. [SATURNUS.] According to some traditions, it had been celebrated by the Aborigines long before the building of the city, and was instituted by the fabulous king Janus, after the disappearance of Saturnus from the earth. Others said that it was instituted by the Pelasgians, or by the followers of Hercules, who had been left behind in Italy. (Macrob., *Sat.*, i. 7.) A second set of traditions referred the institution of the Saturnalia to a much later period; one of them ascribed it to king Tullus Hostilius, who, after a successful war against the Albans and Sabines, was said to have founded the temple and established the festival of Saturnus at Rome. (Macrob., *Sat.*, i. 8.) Another tradition, adopted by Livy (ii. 21) and Dionysius (vi., *ab init.*) which refers it to a still later time, ascribed the institution of the Saturnalia to the consuls A. Sempronius and M. Minucius (497 B.C.). The apparent incongruity of this and some other accounts may easily be removed: those who trace the Saturnalia to a period antecedent to the building of the city, can [illegible] that the worship of Saturnus was very antient in Italy, while those who assign a later date to the institution must be understood to refer to the introduction of the worship into the city of Rome; and although festivals in honour of Saturnus may have been celebrated at his altar in the Roman Forum previous to 497 B.C., yet the regular and periodical celebration of the Saturnalia may not have been established before this time, when a temple was dedicated to the god in the clivus leading from the Forum to the Capitol. After this time the Saturnalia were celebrated regularly every year, on the 19th of December, the whole of which month was sacred to Saturnus; but after J. Cæsar had added two days to this month, the celebration began on the 17th (Macrob., *Sat.*, i. 10), and the people, being fond of such merry-makings, continued the festivities until [illegible] nineteenth, and even longer. This however was [illegible] novation produced by the alteration of the calendar, [illegible] before that event the Romans had been in the habit of making many holidays (generally seven) at the season of the Saturnalia, though it was known that the festival of Saturnus itself did not last more than one day. Augustus [illegible] sanctioned the celebration of the Saturnalia during [illegible] days, and Caligula and Claudius increased the [illegible] five days. (Macrob., *Sat.*, i. 10; Sueton., [illegible] Cass., lix., p. 739.)

The Saturnalia was a harvest festival, and was held, as we have seen, at a time when all agricultural labours were over, and as at such a season every husbandman would naturally give himself and his servants a holiday, and offer his prayers to the god whose especial protection he solicited, so the Saturnalia were national festivals instituted with the same object. It was generally believed that during the golden age of the reign of Saturnus there were no slaves, and the Saturnalia were intended to restore that happy state of things for a short time, by giving to servants and slaves a complete holiday. They were on this occasion allowed to appear in the dress of free citizens (Dion Cass., lx., p. 779), were waited upon at their feasts by their masters, were free from every kind of service, and enjoyed the most perfect freedom of speech. Even criminals were sometimes restored to freedom, and then dedicated their chains to Saturnus. The whole season was one of universal rejoicing for all the people of Rome, and the city resounded with the shouts, 'Io, Saturnalia! Io, bona Saturnalia!' Everybody ate and drank plentifully, and invited or visited his friends and relations. It was also customary for persons to make presents to one another on this occasion (Senec., *Epist.*, 18; Sueton., *Aug*, 75), and clients presented their patrons with wax-candles. (Macrob., *Sat.*, i. 7; Varro, *De Ling. Lat.*, iv., p. 19, Bipont.) Children generally received little figures, which were called oscilla, or sigilla, from which the last day of the Saturnalia derived the name 'sigillaria.' During this festival all business, private as well as public, was suspended; no war was commenced, no battle was fought, and no punishment was inflicted on offenders. (Macrob., *Sat.*, i. 10.) The persons who offered sacrifices to Saturn had their heads uncovered.

The Greek writers, when speaking of the Roman Saturnalia, generally call the feast 'Kronia,' as they considered the two festivals, as well as the deities in whose honour they were held, Saturnus and Kronos, as identical. (Comp. Buttmann, *Mythologus*, ii., p. 52, &c.; Hartung, *Die Religion der Römer*, ii., p. 124, &c.)

SATURNUS, one of the principal divinities of the antient Italians, was considered to be the protector of agriculture and of all civilization arising from it, whence he is generally represented with a sickle in his hand. His name probably contains the same element as the verb *sero* (sa), whence he was considered as the protecting divinity of all that was sown and planted, and as the giver of plenty. The Italian legends represented him as having come from abroad to the shores of Italy, in the reign of Janus, by whom he was hospitably received. Notwithstanding this, Saturnus was always considered as the first king of the Aborigines, probably because agriculture and civilization in Italy dated from his reign. (Virg., *Aen.*, viii. 319; Aurel. Vict., *De Orig. Gent. Rom.*, c. 1, &c.) He was said to have established a settlement on the Capitoline Hill, which from this circumstance was called the Saturnian Hill, and the settlement itself, Saturnia. He now began to teach the Italians the art of cultivating the fields, and led them from their savage state to the peaceful occupations of civilised life, so that the whole land of Italy was called, after him, Saturnia, or the land of fruit. In agriculture he is said to have taught his subjects the use of manure (stercus), from which he derived the surnames of Stercutus, Stercilinus, and Stercenius. (Macrob., *Sat.*, i. 7.) His rule was so just and mild, that the age in which he reigned was afterwards described as the golden age of Italy. His wife, called Ops, was in aftertimes worshipped as the goddess of plenty. After the death of Saturnus, or rather after his disappearance from the world, he was raised to the rank of a god, an altar was erected to him on the spot which was afterwards called the Forum, and a temple near the foot of the Capitoline. Concerning his worship at Rome, see SATURNALIA.

The Greek writers and the later Romans, who were fond of identifying the deities of the two nations, by which they produced great confusion in the mythology of Italy, considered Saturnus and Kronos as the same divinities. This opinion has been maintained with strong arguments by Buttmann, *Mythologus*, ii., 28, &c.; but Hartung, in his *Die Relig. der Röm.*, ii., p. 123, more justly considers the two divinities as quite distinct, and Saturnus as an antient national divinity of the Italians.

SATYR (Satyrus, Σάτυρος) is the name by which the antients designated a class of rustic deities, or Dionysii. Like the Panes and Fauni, they were a kind of intermediate beings between men and animals, and the features which they had in common with the latter were chiefly derived from goats. They seem originally to have been a sort of rustic or sylvan gods, who were worshipped in some parts of Peloponnesus. In the earlier works of antient art they are represented with rather long and pointed ears, bald-headed, and with little protuberances like horns behind their ears. Sometimes their figure approached still nearer to the animal form, as they were represented with goats' feet and horns. During the best period of Grecian art the human form is entire, and the animal character is expressed by a little tail at the lower part of the back, and by a considerable degree of sensuality in the features and attitudes. Satyrs were the constant companions of Bacchus, and in Bacchic processions they always appear dancing, with cymbals or flutes in their hands. In the Greek drama the chorus at the Bacchic festivals originally assumed the character of satellites of Bacchus, that is, of satyrs, and it is expressly stated that Arion not only invented the tragic dithyramb, but introduced satyrs, whence, according to some accounts, the name tragedy, or goats' song, arose. But the chorus of the Attic tragedy, in the course of time, gradually lost its satyric character, and a distinct satyric drama was developed, which is described by the antients as a playful tragedy. The complete separation of this satyric drama from tragedy is ascribed to Pratinas of Phlius.

(Müller, *Archäolog. der Kunst*, p. 515, &c.; H. C. A. Eichstädt, *De Dramate Græcorum Comico-Satyrico*, Lips., 1793; and above all, Casaubon, *De Satyrica Græcorum Poesi et Romanorum Satira*.)

SATYRIC DRAMA. [EURIPIDES.]

SAUERLAND. [GERMANY.]

SAULIEU. [CÔTE D'OR.]

SAUMAISE. [SALMASIUS.]

SAUMUR, a town in France, in the department of Maine et Loire, on the Loire; 182 miles from Paris by Orléans and Tours, 40 from Tours, and 29 from Angers, the capital of the department. Saumur is not noticed in history before the eighth century. In the eleventh century it belonged to the count of Blois, from whom it was taken by Foulques or Fulk Néra, duke of Anjou. In the reign of Henri III. it was placed, as security for some engagement, in the hands of Henri IV., who appointed Du Plessis Mornay governor. Under the care of this eminent man, it rose to great prosperity; the Huguenots from all parts came to settle here; an academy was instituted, and commerce and the arts flourished. But the revocation of the edict of Nantes ruined the town: the population diminished from 25,000 to a fourth of that number; and it has with difficulty recovered so far as to number, in 1831, 9977 for the town, or 10,652 for the whole commune; and in 1836, 11,925 for the commune. Saumur was taken in June, 1793 by the Vendeans, but they were forced, after a few days, to evacuate it. The town stands on the south bank of the Loire, which here flows in a divided channel, forming a number of small islands opposite the town. The suburb of La Croix Verte, through which the road from Tours to Angers passes, is on the north bank of the river, and is united to the town by a succession of bridges, of which that nearest Saumur is a noble structure nearly 900 feet long, with twelve arches. The river Thoué flows near the town on the south-west side, and joins the Loire a short distance below. Saumur is ill laid out, but the houses are pretty good and built of stone, and a considerable number of them may be called handsome; the new quarter of the town presents a fine appearance. There is a fine quay along the bank of the river. Among the public buildings are the church of St. Pierre, an antient structure with a modern portal and a steeple remarkable for the boldness of its architecture; the church of Notre-Dame-des-Ardillières; the town-hall, a Gothic building; the antient castle, long used as a state prison, and now occupied as an arsenal; the theatre, elevated on arches which inclose a market-house, and handsome within; a fine range of cavalry barracks, with two riding-houses; the abbey of St. Florent; and the house formerly belonging to the abbot, restored by Napoleon. There are altogether in the town five bridges, four churches, two nunneries, a foundling and two other hospitals, a high school, a cavalry school, a public library, a theatre, handsome public baths, and a prison.

The townsmen manufacture beads and other small ornamental wares in glass and enamel, and some copper and iron utensils: there are rope-walks, tan-yards, curriers' shops, and a refining-house for saltpetre. The glass and enamel works give employment to 600 persons of both sexes and of all ages. Trade is carried on in corn, pulse, white wines of good repute, brandy, vinegar, hemp, flax, and plums: there are four tolerably large fairs in the year. Sandstone, which does well for building, is quarried in the neighbourhood: a considerable quantity is sent down the Loire to Nantes.

Saumur gave name to the district of Saumurais, a subdivision of Anjou. It was the birth-place of Madame Dacier.

SAUNDERSON, DR. NICHOLAS, an English scholar, particularly distinguished by the extent of his acquirements in classical learning and mathematics, under the disadvantageous circumstance of having become blind from the small-pox at the age of twelve months.

He was born in 1682, at Thurleston in Yorkshire, where his father held an appointment in the Excise; and at an early age he attended the free-school at Penniston, where he was taught the rudiments of the Latin and Greek languages. It is not stated by what means the youth obtained a knowledge of the forms of letters or numbers; and probably the first instruction which he received in literature and science was conveyed to his mind by oral information only.

The elder Saunderson appears to have very soon observed the predilection of his son for mathematical subjects, and though burthened with the duties of his appointment and the cares attending a numerous family, he laboured diligently to make him acquainted with all the science which it was in his power to communicate. This consisted merely of the first elements of numbers; and low as these may be in the scale of knowledge, it will be readily conceived that the anxious parent must have had an arduous task to perform in enabling a pupil bereaved of sight to understand the combinations which enter even into the rules of common arithmetic. The benevolence of Mr. Richard West of Underbank and Dr. Nettleton came however in furtherance of the father's efforts; and these gentlemen perceiving the remarkable talent of the youth, then about 18 years of age, zealously exerted themselves to communicate to him instruction in algebra and geometry. By the kindness of his friends, young Saunderson was also enabled to spend some time in the prosecution of his studies at an academy near Sheffield. From this time his progress became rapid. By the help of a retentive memory he succeeded in resolving the questions usually given as exercises in elementary works, and by the power of his genius he discovered methods of investigating propositions of considerable intricacy. His application to mathematics did not however prevent him from continuing to cultivate the study of classical literature; and it is stated that, besides making himself familiar with Cicero, Virgil, and Horace, he became enabled to understand the works of Euclid, Archimedes, and Diophantus, when read to him in the original Greek.

Mr. Saunderson having decided on making an effort to establish himself at Cambridge as a teacher, went to that university in 1707. He resided in Christ's College, and immediately commenced a series of lectures on the Universal Arithmetic, the Optics, and the Principia of Newton. At this time, Mr. Whiston, the Lucasian professor of mathematics, was engaged in the delivery of lectures on the same subjects; and it is honourable to the benevolence of this gentleman, that he readily consented, at the request of the friends of the blind youth, that the latter should labour in the same field. The peculiar circumstances under which Saunderson taught, and his great talents, procured for him many pupils, and were the means of bringing him into a correspondence with Sir Isaac Newton, and to an intimacy with the other great mathematicians of that time. When Whiston was removed from his chair, in 1711, queen Anne, at the recommendation of Sir Isaac, was induced to confer on Mr. Saunderson the degree of M.A., in order that he might become qualified to hold the place which had become vacant by the retirement of his friend. Saunderson, on being appointed, pronounced an inaugural discourse in Latin, and from that time devoted himself wholly to his professional duties. In 1723 he married a daughter of the Rev. Mr. Dickens, rector of Coxworth; and in 1728, when the king, George II., visited the university, he was, by the royal authority, made Doctor in Laws.

Dr. Saunderson continued to enjoy good health till near the end of his life. He died on the 19th April, 1739.

This extraordinary man composed, in writing, for the use of his pupils, several lectures on different subjects in natural philosophy, but they were never prepared, nor perhaps intended for publication. A valuable treatise which he had composed on the elements of algebra, appeared at Cambridge in 1740, in two vols. 4to.; and another on fluxions in 8vo, including a commentary on some parts of Newton's 'Principia,' came out in the year 1756.

In order to perform arithmetical computations, Saunderson used a square board divided by lines at one-tenth of an inch asunder, and parallel to the sides, into many small squares, each of which was pierced with nine holes in three parallel rows. Small pins were placed by the hand in these holes, and the value of a digit was indicated by the particular hole, in each square, in which the pin was placed. A pin with a large head placed in the centre hole denoted zero, and one with a small head in the same hole indicated unity. A large-headed pin in the centre, with a small-headed pin in the first hole of the first row, expressed the number 2; a large-headed pin in the centre, with a small-headed pin in the second hole of the first row, expressed the number 3; and so on. The process is described in the first volume of the 'Elements of Algebra,' and it is evident that by such means any number may be easily expressed, and any arithmetical operation performed. He used the same machine for representing geometrical diagrams; the pins being placed at the angles of the figure, and connected by threads which indicated the lines.

His ideas of the forms which plane or solid figures would assume when viewed by an eye placed in a given position, were remarkably correct and distinct; and we are informed by Dr. Reid (*Inquiry into the Human Mind*, ch. 6), that he understood the rules of perspective and the projections of the sphere. But the mental process by which he acquired this kind of information was probably peculiar to himself: for Dr. Reid states that once in conversation Saunderson acknowledged that he had found great difficulty in understanding Dr. Halley's demonstration, that the angle made by two circles of the sphere was equal to the angle made by their projections on a plane, adding that when he considered the proposition in his own way he became aware of its truth.

Dr. Saunderson possessed in a high degree the senses of feeling and hearing. It is said that he could distinguish true from counterfeit Roman medals by the different degrees of their smoothness; and on one occasion, when some students were taking the sun's altitude in the garden of Christ's College, he could tell, by some effect of the air upon his person, when very light clouds were passing over the disk of the luminary. When he entered a room, he could judge of its magnitude and of his distance from the walls by the sound of his footsteps. In his youth he had learned to play on the flute; and it is said that he succeeded so well as to give room to suppose that if he had applied himself to music, he might have excelled in it to as great a degree as in mathematics.

Saunderson is described as having been extremely passionate. He was imbued with a strong sense of the importance of truth, but he too often expressed his sentiments with a freedom which caused him to have many enemies. It may be said that he was better qualified to inspire admiration than to make or preserve friends. He is accused moreover of having been decidedly a sceptic in matters concerning religion.

SAURAT, a town in France, in the department of Ariège, not far from Tarascon. The inhabitants, who, in 1831, amounted to 2563 for the town, or 5014 for the commune, are engaged in the manufacture of wrought-iron, into which the ore is immediately converted. Charcoal is the fuel exclusively employed. The ore is obtained in the neighbourhood. There are two fairs in the year.

SAURIANS (*σαῦρος*, or *σαύρα*, a lizard), the term by which the great family of Lizards is generally designated. The animal forms more strictly included under it are those comprised under the genus *Lacerta* of Linnæus (after deducting the Crocodilians and the Salamanders), and under the genus *Draco* of the same author.

To these, Cuvier observes, the family *Anguis* might even be joined, because their osteology, especially that of the head, resembles the osseous structure of many of the Lizards.

In the large acceptation of the term *Saurians*, the Pterodactyles, Enaliosaurians, and Crocodiles are included.

The general arrangement of this order will be found under the article REPTILES.

ORGANIZATION.

Skeleton.—If we take the living forms collected under the genera of Linnæus above mentioned, after eliminating from the genus *Lacerta* the groups above excepted, we shall find that all the animals have a similar structure of the skull, of the shoulder-blade, and of the *os hyoïdes*, or that they exhibit but slight variations in the composition and proportion of the parts, whilst they differ considerably from the Crocodiles and Tortoises, and still more from the Salamanders, as Cuvier, with his usual acuteness, has observed.

Skull.—Cuvier remarks that the common characters of this family, relatively to the osteology of the head, consist principally of the following points:—

1. The four ordinary occipital bones form the ring which surrounds the encephalon backwards. The lateral occipital is not divided into two, as in the Tortoises. In front of the occipital bones are placed the sphenoïd below, and the *os petrosum* laterally: the parietal covers the whole like a roof.

2. The sphenoïd bone is visible throughout its inferior surface; the pterygoïdians, forming a simple continuation of the palatine bones, are prolonged to the internal border of the tympanic cavities (caisses), not touching the sphenoïd, except upon a lateral tuberosity of that bone, and not uniting together.

3. The sphenoïd is prolonged forwards into a cartilaginous stem upon which the interorbitary partition is elevated; and in this last, various points of ossifications show themselves, which belong to the ethmoïd bone.

4. The bone analogous to the *os petrosum*, which is not hidden by the tympanic cavity, is extended outwards, and forms, between the sphenoïd and the occipital bones, the whole of the posterior lateral wall of the cranium.

5. The anterior lateral wall of the cranium, from the *os petrosum* to the interorbitary partition, is membranous, and contains only on each side a bone of various configuration according to the species, the temporal *ala* and the orbitary *ala*.

6. An osseous stem rises from the upper border of the pterygoidian, where it is articulated in a fosset up to the lateral or parietal border, where it is attached by a ligament. Some anatomists,* says Cuvier, have thought that they saw in it the analogue of the temporal *ala*, but it does not fulfil the functions of that process; others† have named it *tympanic*, without even a perceptible motive, however distant, for such a determination. One cannot even say that it is properly comprised in the wall of the cranium, and this wall has also sometimes in the thickness of its membranes a point of ossification which represents the true temporal *ala*. Cuvier then states that he would call this bone the *columella*. Its function is to sustain the vault of the cranium, which is not otherwise supported in front, because the orbital *ala*, the temporal *ala*, and the ethmoïd bone are in great part membranous.

7. The lateral occipital bone has a part projecting outwards, to which are united by their extremities the mastoïdian, which is very much reduced, and the temporal bones; to this common reunion of the three bones is suspended the tympanic bone, which descends vertically to serve as a pedicle to the lower jaw. This bone, most frequently, is not attached, except to the anterior edge of the tympanum; and the rest of the contour of that membrane, as well as the posterior wall of the tympanic cavity, is cartilaginous or even only simply membranous.

The Eustachian tube is only a wide communication of the tympanic cavity to the posterior part of the mouth, between the extremity of the pterygoïdian and the sphenoïd. In the recent animal it answers to that part of the inside of the mouth near the articulation of the jaws, and the communication is sometimes so open that the *ossiculum auditûs* may be said to be in the mouth or in the pharynx. The cavity of the vestibule is formed in common by the *os petrosum*, the lateral occipital, and the superior occipital. The *fenestra ovalis*, where the *ossiculum auditûs* is attached, is common to the *os petrosum* and the external occipital. Under it is a wider aperture, pierced in the lateral occipital bone only, and at the bottom of which are two holes, one anterior, which goes into the cranium, and one posterior, which is the *fenestra rotunda*, and leads into a fosset of the vestibular cavity, which represents the *cochlea*.

8. The transverse bone unites the pterygoïdian bone to the jugal and the maxillary, as in the crocodile.

9. The palatine bones have no palatine laminæ, or, at least, these laminæ are not sufficiently extended to unite; and the posterior bony nostrils are great holes in the anterior part of the vault of the palate, between the maxillary bones, the vomers, and the palatine bones.

10. The extremities of the external bony nostrils are always separated in the skeleton by an internasal apophysis of the intermaxillary and sometimes of the maxillary bone.

For the rest, the division of the frontal bone into the principal, the anterior, and the posterior, and the other osteological circumstances, are as in the tortoises and crocodiles.

This constitution of the cranium of the Saurians, adds Cuvier, which will also serve to explain that of birds, requires to be discussed and proved; and he, accordingly, addresses himself to the task.

He observes that there is no difficulty with regard to the occipital bones, which are four in number, as in the crocodiles and mammals. The principal frontal and the parietal bones may be demonstrated to be what they are by the same arguments as hold good in the crocodile and in the tortoise. These arguments are also perfectly applicable to the anterior and posterior frontal bones, to the lachrymal bones, to the maxillaries, and the intermaxillaries. It is then, as usual, in the region of the temples and of the ear that some difficulties remain; but these are easily disposed of when we consider each of the pieces which compose it in the genera, which offer tangible analogies with the crocodiles and tortoises. Thus, the nature of the *os petrosum* is determined, as in the crocodile and in the tortoise, by the part which it takes in the constitution of the internal ear, and especially of the vestibular cavity, as well as by the notch for the exit of the nerve of the fifth pair.

The tympanic bone is nearly always reduced to a prismatic form, does not consolidate (ne s'engrène point) with the other bones to form a part of the solid envelope of the head, and seems in the skeleton to be nothing but a pedicle for the lower jaw. But besides that the tympanum is always attached to it, it will be found on examination, in the dragon for instance, in the form of a drum, more hollow and with edges more reflected (revenans en avant) than in the tortoises themselves, having behind, as in the tortoises, a notch for the *ossiculum auditûs*. The only difference is, that its cavity does not extend into the mastoïdian. In the scink it is still more wide and concave, whilst it is less closed by the edges than in the dragon. The scink also exhibits a striking analogy with the tortoises, inasmuch as that its temporal bone is covered by a lamina of the parietal bone, which unites with a great enlargement of the posterior frontal, and with the temporal, placed and notched as in certain tortoises, but longer and narrower Thus, the mastoidian bone must be recognised as such, notwithstanding its extreme smallness. The common lizard has the same covering on the temporal bone, and, moreover, all the upper part of its orbit is covered by an expansion of the anterior frontal bone.

The *lower jaw* of the Saurians is composed of six bones on each side, as in the crocodile and tortoise, but rather otherwise disposed, and producing a general form which is somewhat different; thus the coronoïd apophysis projects very much, and is placed more forward; the lower angle has also a more forward position, and the dental part is shorter in proportion.

The dental bone does not carry the teeth in alveoli or sockets, as in the crocodile, but they adhere to its internal surface. Its external surface is united backwards by a squamous suture to those of the complementary, the surangular, and subangular portions. The part of the internal surface of the dental bone, which the opercular bone covers below and behind the teeth, varies much in extent in different subgenera. The opercular bone is united backwards to the internal surface of the complementary, the articular, and angular portions, and often to that of the surangular portion.

The complementary portion forms alone the great coronoïd apophysis, extends on the upper edge of the jaw in front of that apophysis, and descends backwards to the internal surface, where it traverses the surangular to unite itself with the articular portion.

The articular portion furnishes the glenoïd facet, and the apophysis, which is behind it, for the digastric muscle, and has often even a small epiphysis at the extremity of this apophysis; it advances to the internal surface, and even sometimes along the inferior border to the opercular bone.

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* Oken and Spix.

† Bojanus.

The angular portion extends under the portion of the lower border, which is between the lower angle on one side, and the dental or opercular portion on the other. It is not always that the angle of the jaw entirely belongs to this, for the opercular bone sometimes contributes to form it.

The surangular portion occupies nearly the whole of the external surface of the superior moiety between the four other bones which are seen on this aspect. It forms the upper border between the coronoïd apophysis and the articulation.

For the entrance of the nerves and vessels there is a great opening on the internal surface of the coronoïd apophysis, between the complementary, the surangular, and the articular portions; and for their exit there are holes at the external surface of the dental bone and on the internal surface of the opercular bone. The number and the position of these holes vary according to the subgenera and species. The surangular portion generally has two.

Such are the general dispositions, noticed by Cuvier, common to all the Saurians; and he proceeds to point out the principal differences observable in the subgenera.

The same distinguished zoologist remarks that the *os hyoïdes* becomes important in proportion as we approach the fishes; and he observes that in man it is composed of five parts: viz. a body in the form of a flattened transversal arch; two anterior and very long horns, which proceed to attach themselves to the temporal bone below the *meatus auditorius*, and of which the upper part is there soldered at a very early period, and takes the name of the styloïd process of the temporal bone; whilst the lower part, for a long time simply ligamentous, has below, at the point of junction with the body, an osseous grain (*cornu minus*); and finally, two posterior bony *cornua* (*cornua majora*) supporting the larynx by means of a ligament which attaches to them the thyroïd cartilage.

The numerous variations which this bone of the tongue presents in the class *Mammalia*, depend on the form of its body, on the more or less prompt soldering which takes place with the posterior cornua, and on the form and the proportion of the pieces of the anterior cornua. Very often in the Ruminants, the Solipedes, and the Cetaceans, the body takes, in becoming soldered to the posterior cornua, the shape of a crescent; and it often happens also, especially in the two first families, that it produces anteriorly a more or less long apophysis; but the anterior horns are always suspended to the cranium, and nearly without exception to a small apophysis of the *os petrosum* and to the neighbouring part of the tympanic cavity.

This suspension does not take place in those birds in which the anterior horns run round the back of the cranium [WOODPECKERS; TROCHILIDÆ], and are only there attached by muscles and cellular substance.

The body of the tongue-bone is most frequently of a rhomboïdal form. To its posterior part is articulated or soldered a slender unequal bone on which the larynx reposes, and which singly represents the two posterior cornua; and to its anterior part another bone, sometimes double, which penetrates into the tongue, and which Cuvier names the lingual bone. The anterior horns consist generally of only two pieces.

Cuvier then refers to a prior part of his work, in which he had pointed out the simplicity of the *os hyoïdes* in the crocodile, and the variety of that bone in different tortoises. In the Saurians it offers some relations with that of the birds; but its composition is more complex. It generally consists of a simple body and two pairs of cornua, to which a third is sometimes added. The body always gives off anteriorly a slender stem, which is prolonged more or less into a cartilage which penetrates into the tongue. The anterior horns are variously reflected, and the posterior horns differently directed according to the species. With regard to those of the third pair, they exist but rarely, and sometimes are rather posterior productions of the body than particular horns.

Cuvier then proceeds to notice the diversities in the different families, &c.: and he remarks that the *os hyoïdes* of the Saurians continues with little change to the *Ophisauri*, the *Orvets* (*Anguis*), and the *Amphisbænæ*. In the two former the anterior horn is nearly reduced to a membranous state; but the posterior one is well ossified. In the Amphisbænæ the second articulation of the anterior horn is reduced to a simple vestige. There is none in the third horn. The *os hyoïdes* in the true serpents is reduced to two long cartilaginous filaments, which only sustain forwards, as the sole vestige of the body, a species of membrane, hardly discernible in those which are not very large.

The *teeth* in the true Saurians are not placed in sockets nor are those which are to replace the teeth which are lost or shed produced in the cavities of the old teeth; but the gelatinous germs of the teeth adhere to the internal surface of the dental bone without having any bony partitions between them, and sometimes without being guarded on the internal side by a lamina of that bone: in the latter case their bases are only separated from the cavity of the mouth by the gum. The base is not divided into roots; but when the tooth grows, the same phenomenon is manifested as is seen in fishes. The gelatinous nucleus becomes ossified; it unites itself intimately on one side to the bone of the jaw, whilst it contracts on the other an intimate adherence with the tooth which it has exuded; the tooth then appears like a prominence, an apophysis of the jaw, only it is covered with enamel, whilst its base is naked and purely osseous, and around this base are to be seen striæ and little pores by which the vessels have penetrated or still penetrate into its internal cavity, and which also mark the spot where the rupture will take place when this tooth must yield up its place. The new teeth spring not in the cavity of the old ones, as in the crocodile, but near the internal surface of their base, or in certain species in the thickness of the bone above or below the base according to the jaw. In the last case which takes place, for example, in the *Monitors* and the *Dragons*, it forms for itself in the bone a cavity which lodges during a certain time the pulpy nucleus and the crown which is produced above. This cavity opens by degrees to the internal surface of the dental bone. In the other case the pulpy nucleus is developed simply under the gum; but in proportion as its crown increases in growth, it often forms a notch in the base of the nearest tooth, where it is partially enclosed. Then it is that one might believe that the new tooth is enclosed in the old one, but it is never entirely enveloped in it. But, continues Cuvier, in whatever manner the new tooth comes, the time arrives when its increase entirely pushes out the old tooth, producing on its ossified base a species of necrosis, which breaks off its adherence to the jaw and causes it to fall out. This is not a rupture in some degree spontaneous, like that of the old antlers of stags, which fall before their successors have budded. (*Ossemens Fossiles.*)

Professor Owen, in his valuable chapter on the 'Teeth of Saurians' (*Odontography*, pt. ii., p. 234, et seq.), commences his inquiry with the *Ophisaurians*, observing that there are several genera of reptiles, which, like the true snakes, are externally devoid of locomotive extremities, or have them indicated only by minute rudiments, but are covered by small uniform scales, and resemble the Saurians much more than the Ophidians in their anatomical structure, especially in the fixed condition of the jaws, which cannot be divaricated laterally, or rotated backwards and forwards upon a moveable tympanic pedicle. These snake-lizards, he observes, have always intermaxillary as well as maxillary teeth.

In the *Amphisbænians*, Professor Owen remarks that there are both pleurodont and acrodont species, as in the true Saurians; but the pleurodonts are the most numerous, and have their teeth applied against the internal surface of an external alveolar wall. In *Trogonophis* however the teeth are blended by their whole base with the alveolar ridge, are so closely approximated that they cohere, and are unequal, conical, subcompressed, and obtuse. The intermaxillary teeth are in unequal number, the middle azygos tooth being longer than the rest.

In CHIROTES, Professor Owen found the teeth slightly curved, simple, and nearly equal, with the exception of the azygos intermaxillary tooth, which is longer than the rest. They are small at first, but increase as they are placed backwards.

In AMPHISBÆNA, the teeth are short and conical: five are fixed to the intermaxillary bone, of which the middle tooth is longest; five teeth are on each superior maxillary, and eight on each premandibular bone; the first tooth short, the second and third longest.

The typical *Blind-worms* or *Anguians* [Orvet] have, according to the Professor, only maxillary teeth; the palatine teeth being absent. In *Anguis fragilis* [Blind-worm] the first five of the upper teeth on each side are small, with cutting edges, and are placed on the intermaxillaries; the next eight are much larger, pointed, and recurved, and are separated by intervals. In general form therefore, Mr. Owen observes, the teeth of the true *Anguis* adhere to the Ophidian type; but in the *Ophiomerus*, or miliary blind-worm, and in the *Acontias* [Javelin Snake], they are conical, obtuse, and straight. In the subgenera *Lerista, Ablepharus, Hysteropus, Dibamus, Typhlinus,* and the rest of the family of blind-worms, the teeth are likewise simple and conical.

The *Pseudopus Pallasii* [Scheltopusik] is furnished with sixteen teeth on each side of the upper jaw, and twelve (the latter in a continuous series) in the lower jaw. A median interval separates the two lateral series in the upper jaw. The anterior teeth in both jaws are conical and obtuse; the posterior teeth have a hemispherical triturating crown. The palate is armed with small conical and simple teeth, which are arranged in one moderately long row on each side.

Ophisaurus is provided with a close-set row of simple teeth in both jaws, and Professor Owen observes that these glass-snakes very remarkably repeat a dental character observable in certain Batrachians, especially the Newts of the same continent to which these Ophisaurs are peculiar; for they have teeth at the roof of the mouth, arranged in several rows, chiefly supported by the pterygoïds, and in a small proportion by the palatine bones. The teeth composing this 'palatal pavement' are short and conical; the maxillary teeth are described as subcylindrical and simple. The entire number of teeth amounts to twenty on each side of the upper jaw, and eighteen on each side of the lower jaw.

No palatal teeth have been detected in *Pantodactylus*, in which the maxillary teeth are slightly compressed with a tricuspid crown. The intermaxillary teeth are conical and simple. The teeth are close set and equal.

Ecpleopus is similar in its dentition to *Pantodactylus*, with the exception of the inequality in the maxillary teeth, and their termination in a simple obtuse summit.

In the Monodactyle or Anguine lizard (*Lacerta Monodactyla*, Shaw; *Chamæsaurus*, Dum. et Bib.) these teeth are subcylindrical and obtusely pointed; and, as in the two preceding genera, there are no palatal teeth. In the heterodactyle *Chalcis* [Chalcides] the maxillary teeth are slightly compressed, straight, and divided into two or three obtuse points. Those of the annulated Chalcis are described as conical and terminating in a simple obtuse summit. In neither species are the teeth implanted in sockets, but applied to the inner margin of the alveolar ridge.

In *Zonurus griseus* there are about twenty equal, conical, or subcylindrical, obtuse teeth on each side.

The intermaxillary teeth of *Tribolonotus* and *Saurophis* are conical; and the maxillary teeth are straight and subcylindrical, with obtuse summits. There are no teeth on the roof of the mouth of these genera.

In *Gerrhosaurus*, as in *Tribolonotus*, the intermaxillary and anterior maxillary teeth are conical; but the posterior teeth are compressed, and terminate in a bilobed summit. The *Gerrhosauri* differ further in having a row of small conical teeth on each pterygoïd bone.

The posterior maxillary teeth of *Gerrhonotus* are simply obtuse at the summit, and the pterygoïd teeth are not so numerous.

In Bipes (*Scelotes*, Fitzinger) the teeth are confined to the jaw-bones, and are conical and simple. The same dentition is characteristic of *Seps* [Scincoidians.] Professor Owen further observes, that the teeth of *Seps chalcides* are very small, and that their obtuse apex just protrudes above the gum at the anterior part of the mouth; but they gradually increase in size as they are placed farther back.

The Scincoidians, or smooth-scaled lizards, have small mouths and slender sharp teeth, fitted apparently, observes Professor Owen, for insect food.

The teeth in *Tropidophorus* are described as straight, cylindrical, simple, slightly compressed at the summit, and confined to the jaws. In the true Scinks (*Scincus*, Dum. et Bibr.), of which the *Scincus officinalis* is the type, the palate also is furnished, four or five small obtuse teeth being situated on each pterygoïd bone. The maxillary teeth of *Scincus* are conical, obtuse, and sometimes slightly incurved.

The palate has no teeth in the short-footed Scinks (*Sphenops*, Wagler), and their maxillary teeth are conical, straight, pointed, smaller, and more numerous than in the common Scink. In the Galliwasps (*Diploglossus*) the jaws are armed with equal, close-set, simple, conical teeth, which are sometimes subcompressed at the crown. The palate is toothless. The teeth are compressed, and their crowns are wedge-shaped in most of the species of *Gongylus*, Dum. et Bibr. They are equal, conical, and only slightly compressed at the summit in the subgenus *Eumeces*. In the carinated Scink and its congeners (*Euprepes*), the pterygoïds are furnished with teeth, which are very numerous in the Golden Scink (*Euprepes Cyprius*), each of whose pterygoïds supports two rows of short, straight, strong conical teeth; the maxillary teeth resemble those of the other *Euprepes*. In a large species of Scink figured by Cuvier, the maxillary teeth have expanded crowns with a dentated margin, but the pterygoïd teeth are wanting.

In a genus of Australian Sincoid lizards (*Cyclodus*), there is, Professor Owen remarks, a difference from the rest of the tribe in the subhemispherical form of the teeth, which resemble tubercles, instead of more or less pointed cones, and the species manifest a corresponding difference in their habits and the nature of their food. The dentition of *Cyclodus nigroluteus* is accurately figured by Mr. Owen, in pl. 26, *fig.* 7, and the details, to which we refer the reader, are given with his accustomed clearness. 'All the teeth are,' he observes, 'attached, after the pleurodont type, by their base and outer margin to a shallow depression on the outer side of the external alveolar parapet. The germs of the successional teeth are developed at the inner side of the base of their predecessors, which they excavate, undermine, and displace in the usual manner. I have not seen any specimens of this genus which had the branches of the lower jaw anchylosed at the symphysis. The pterygoïd bones present a rugous surface at the place where they ordinarily support teeth.'

In the Chameleons, the same author states that the teeth are conical, compressed, trenchant, with the summit simple, or terminating in three points, arranged in the same longitudinal line; and that, in most species, the teeth gradually increase in size, and become wider apart as they are situated farther back upon the jaws. Professor Owen further observes that the teeth are so completely confluent with the alveolar plate, as to appear, externally, when in place, to be mere processes of that border of the jaw; but, he remarks, their true nature is evident when viewed from the inner side of the jaw. The number of teeth vary in the species.

In the *Agamanians*, or Agamoïd Lizards, forming the genus *Uromastyx*, the dentition, which at first sight seems to consist of a merely notched or dentated margin of the jaw, resembles that of the Chameleons. These notches, or processes, are however true teeth, originally developed as independent parts, and afterwards becoming confluent, by their base and a great part of the outer side, with the alveolar parapet of bone. Mr. Owen points out, in continuation, that in the young of *Uromastyx* there are from two to four anterior or intermaxillary teeth, which subsequently become anchylosed together, so as to appear like one lobated tooth. In the lower jaw the crown of this complex tooth is received into a wide interspace between the two anterior teeth. The molar teeth are described as triangular or subcylindrical, with rather obtuse and subcompressed summits, approximated, and increasing in size as they recede backwards.

In the common *Stellio*, Professor Owen found most of the teeth, sixteen or seventeen on each side, triangular, with a small cusp before and behind, and two larger conical teeth, like canines, at the anterior part of the upper and lower maxillary bones. Two small conical teeth, which have no correspondents in the lower jaw, are supported by the intermaxillary bones.

The canines of the Dragon are proportionally longer than those of *Stellio*, but otherwise the dentition is the same.

There is a resemblance between the mutable *Agamæ* (*Trapelus*) and the *Stelliones*, inasmuch as the former have two conical teeth longer than the rest, beginning the series in the lower jaw and superior maxillary bones; but the *Agamæ* have four small conical intermaxillary teeth, without corresponding teeth below. Seventeen triangular teeth were found to succeed the canines in the lower jaw, and fifteen in the upper jaw, in *Trapelus ater*. *Agama orbi-*

culuris resembles the *Trapeli* in its dentition, with the exception that the molar teeth behind the canines are more conical.

In the common *Calotes* the inferior maxillary dental series is described as commencing with four simple conical teeth, and in the upper jaw with six: of these last, Professor Owen remarks that the middle smaller ones might pass for incisors, and the external ones for canines: behind these he describes a series of molar teeth with compressed triangular and tricuspid crowns, the median cusp being much the longest of the three: these teeth increase in size towards the back part of the jaw.

In the *Geckotians* [Gecko] the teeth are more pointed, more slender, more equable, and more numerous than in the preceding group. The Professor remarks that the summit of the tooth is always simple, and that the base is obliquely soldered to the internal surface of an outer alveolar parapet. The number of the teeth varies very much in the different subgenera; but none of the *Geckotidæ* have teeth on the roof of the mouth.

The *Iguanians* [Iguana] are next noticed by Professor Owen as characterised, like the preceding groups, by a short contractile tongue, slightly notched at its extremity, but, as he remarks, they are distinguished for the most part by having teeth on the pterygoïd bone, and also by the complicated form of the crown of the maxillary teeth in the typical genera, the species of which subsist chiefly on vegetable substances. In most of the family the teeth are set in a common shallow oblique alveolar groove, and are soldered to excavations on the inner surface of the outer wall of the groove.

The following genera are enumerated by MM. Duméril and Bibron as showing the pleurodont type of dentition, and as being also furnished with pterygoïd teeth, viz.:—*Polychrus*, *Urostrophus*, *Anolis*, *Corythophanes*, *Basiliscus*, *Aploponotus*, *Amblyrhynchus*, *Iguana*, *Metopoceros*, *Cyclurus*, *Brachylophus*, *Leiosarus*, *Hypsibates*, *Proctotretes*, *Ecphymotes*, *Stenocercus*, and *Oplurus*. But the following pleurodonts, *Hyperanodon*, *Tropidolepis*, *Phrynosoma*, and *Callisaurus* have no pterygoïd teeth.

In the genera *Istiurus*, *Calotes*, *Lophyrus*, *Otocryptis*, and *Chlamydosaurus* among the Acrodonts, the maxillary teeth may, Professor Owen observes, be divided into anterior, laniary, and posterior molar teeth; and he states that no Iguanian lizard has teeth on the palatine bones.

'The most strictly vegetable-feeding reptiles,' says the Professor, 'are the true *Iguanæ* and the *Amblyrhynchi*; yet the size of the teeth, their mode of implantation, and the limited motions of the jaws permit only an imperfect comminution of the food by these instruments; and their summits are rather chipped off than ground down by use. The appearance of abrasion is greatest in the posterior teeth; especially in the *Iguana cornuta*, in which the crowns of the teeth are thicker than in the *Iguana tuberculata*, and make a nearer approach to the very remarkable form of tooth that characterises the gigantic *Iguanodon*.

'Before however proceeding to describe the teeth of this extinct lizard, I shall offer a few observations on the microscopic structure of the teeth of the existing Iguana. In both the common and horned species the teeth consist of a body of simple compact dentine, with the crown covered externally by a thin layer of enamel, and the fang with an investment of cement. The dentine, viewed by transmitted light in a thin horizontal section, exhibits minute calcigerous tubes in a clear substance, radiating from a simple conical pulp-cavity, which is widely open at the base of the tooth, and continues in a linear form into the crown of the tooth; the calcigerous tubes at the base of the tooth proceed in an irregular sinuous course, at right angles to the axis of the tooth: above this part they sweep outwards in a graceful curve, with the concavity turned towards the base of the tooth; as they approach the summit of the tooth, they gradually incline towards it, and those from the apex to the pulp-fissure proceed directly in the axis of the tooth; throughout their course the calcigerous tubes are disposed in minute undulations, and they send off from the concave side of the primary flexures numerous short parallel branches, at an angle of 45°: the branches rise less regularly the nearer the main tube is to its origin from the pulp cavity. The diameter of the calcigerous tubes is [illegible]th of an inch: their interspaces are equal to between three or four of their diameters. In general they do not divide until within a short distance from the periphery of the tooth, near which they subdivide frequently. . . . The tubes at the base of the tooth divide nearer their origin, and more frequently. . . The pulp-cavity in old teeth becomes occupied by a certain coarse bone, characterised by large irregularly shaped calcigerous cells, and the interspaces are filled with irregular moss-like reticulations of tubes. Branches of the pulp-cavity are never continued in the form of medullary canals into the substance of the dentine in the existing Iguanæ. . . . The germs of the successional teeth are developed from the mucous membrane covering the inner side of the base of those in place. The apex of the dentated crown is first formed; by its pressure it excites absorption of the base of the fixed tooth, and soon undermines it, and then occupies the recess in the alveolar plate in the interspace of the two adjoining fixed teeth. After the crown is completed, the rest of the tooth forms a contracted and elongated fang, which at first is hollow, then becomes consolidated by ossification of the remaining pulp, and afterwards a second time excavated by the pressure of a new tooth.'

Professor Owen, after quoting Dr. Mantell and Baron Cuvier, with reference to the Iguanodon, observes that a subsequent discovery by the former of a portion of the lower jaw of this extinct lizard confirmed the previous inference as to the mode of attachment of the teeth, and approximates this gigantic species to the pleurodont section of the Iguanians; whence, he remarks, it may be inferred that the teeth were nearly all uniform in size and shape, at least not divisible into laniaries and molars, as in the Acrodont Iguanians. He further states that the portion of the lower jaw alluded to, which is now in the British Museum with the rest of Dr. Mantell's noble collection, shows that the Iguanodon differed from the Crocodile not only in the lateral adhesion of the teeth to an alveolar wall, but in their arrangement in a close-set series.

Besides the opportunity of studying this fossil and the extensive series of detached teeth in the Mantellian collection in the British Museum, Professor Owen, having examined the private collections of Dr. Mantell and Mr Dixon of Worthing, and having been favoured by both those gentlemen with the teeth of Iguanodon, had sections prepared for microscopical examination, with the following results:—

'The teeth of the *Iguanodon*, though resembling most closely those of the *Iguana*, do not present an exact magnified image of them, but differ in the greater relative thickness of the crown, its more complicated external surface, and, still more essentially, in a modification of the internal structure, by which the Iguanodon equally deviates from every other known reptile. As in the Iguana, the base of the tooth is elongated, contracted, and subcylindrical; the crown expanded, and smoothly convex on the inner side; when first formed, it is acuminated, compressed, its sloping sides serrated, and its external surface traversed by a median longitudinal ridge, and coated by a layer of enamel; but beyond this point the description of the tooth of the Iguanodon indicates characters peculiar to that genus. In most of the teeth that have hitherto been found three longitudinal ridges traverse the outer surface of the crown, one on each side of the median primitive ridge; these are separated from each other and from the serrated margins of the crown by four wide and smooth longitudinal grooves. The relative width of these grooves varies in different teeth; sometimes a fourth small longitudinal ridge is developed on the outer side of the crown. The marginal serrations, which at first sight appear to be simple notches, as in Iguana, present under a low magnifying power the forms of transverse ridges, themselves notched so as to resemble the mammillated margins of the unworn plates of the elephant's grinder: slight grooves lead from the interspaces of these notches upon the sides of the marginal ridges. These ridges or dentations do not extend beyond the expanded part of the crown: the longitudinal ridges are continued farther down, especially the median ones, which do not subside till the fang of the tooth begins to assume its subcylindrical form. The fang at first increases both in breadth and thickness; it then diminishes in breadth, but its thickness goes on increasing: in the larger and fully formed teeth the fang decreases in every diameter, and sometimes tapers almost to a point.' A fracture of such a tooth, figured by Professor Owen,* shows that the pulp was not entirely solidified; but that its cavity had continued open at the thickest part of the tooth. 'The apex of the tooth soon begins to be worn away; and it would appear, by many specimens, that the teeth were retained until nearly the whole of the crown had yielded to the daily abrasion. In these teeth however the deep excavation of the remaining fang plainly bespeaks the progress of the successional tooth prepared to supply the place of the worn-out grinder. At the earlier stages of abrasion a sharp edge is maintained at the external part of the tooth by means of the enamel which covers that surface of the crown; the prominent ridges upon that surface give a sinuous contour to the middle of the cutting edge, whilst its sides are jagged by the lateral serrations.' [IGUANODON, vol. xii., p. 441.] 'The adaptation of this admirable dental instrument to the cropping and comminution of such tough vegetable food as the *Clathrariæ* and similar plants, which are found buried with the Iguanodon, is pointed out by Dr. Buckland, with his usual felicity of illustration, in his *Bridgewater Treatise*, vol. i., p. 246.' 'When the crown is worn away beyond the enamel, it presents a broad and nearly horizontal grinding surface; and now another dental substance is brought into use to give an inequality to that surface; this is the ossified remnant of the pulp, which, being firmer than the surrounding dentine, forms a slight transverse ridge in the middle of the grinding surface: the tooth in this stage has exchanged the functions of an incisor for that of a molar, and is prepared to give the final compression or comminution to the coarsely divided vegetable matters. The marginal edge of the incisive condition of the tooth, and the median ridge of the molar stage, are more effectually established by the introduction of a modification into the texture of the dentine, by which it is rendered softer than in the existing Iguanæ and other reptiles, and more easily worn away: this is effected by an arrest of the calcifying process along certain cylindrical tracts of the pulp, which is thus continued in the form of medullary canals, analogous to those in the soft dentine of the Megatherium's grinder, from the central cavity, at pretty regular intervals, parallel with the calcigerous tubes near to the surface of the tooth. The medullary canals radiate from the internal and lateral sides of the pulp-cavity, and are confined to the dentine forming the corresponding walls of the tooth: their diameter is $\frac{1}{1250}$th of an inch: they are separated by pretty regular intervals equal to from six to eight of their own diameters; they sometimes divide once in their course. Each medullary canal is surrounded by a clear space: its cavity was occupied in the section described by a substance of a deeper yellow colour than the rest of the dentine. The calcigerous tubes present a diameter of $\frac{1}{25000}$th of an inch, with interspaces equal to about four of their diameters. At the first part of their course, near the pulp-cavity, they are bent in strong undulations, but afterwards proceed in slight and regular primary curves, or in nearly straight lines to the periphery of the tooth. When viewed in a longitudinal section of the tooth, the concavity of the primary curvature is turned towards the base of the tooth: the lowest tubes are inclined towards the root, the rest have a general direction at right angles to the axis of the tooth; the few calcigerous tubes, which proceed vertically to the apex, are soon worn away, and can be seen only in a section of the apical part of the crown of an incompletely developed tooth. The secondary undulations of each tooth are regular and very minute. The branches, both primary and secondary, of the calcigerous tubes, are sent off from the concave side of the main inflections; the minute secondary branches are remarkable at certain parts of the tooth for their flexuous ramifications, anastomoses, and dilatations into minute calcigerous cells, which take place along nearly parallel lines for a limited extent of the course of the main tubes. This modification must contribute, with the medullary canals, though in a minor degree, in producing that inequality of texture and of density in the dentine which renders the broad and thick tooth of the Iguanodon more efficient as a triturating instrument. The enamel which invests the harder dentine forming the outer side of the tooth presents the same peculiar dirty brown colour when viewed by transmitted light as in most other teeth; very minute and scarcely perceptible undulating fibres, running vertically to the surface of the tooth, is the only structure I have been able to detect in it. The remains of the pulp in the contracted cavity of the completely formed tooth are converted into a dense but true osseous substance, characterised by minute elliptical radiated cells, whose long axis is parallel with the plane of the concentric lamellæ, which surround the few and contracted medullary canals in this substance.'

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* Pl. 63 A.

Such is Professor Owen's elaborate and accurate account of his microscopical examination of the teeth of this giant of the Weald, which existed long before man was created; an examination which, as the Professor remarks, contributes additional evidence of the perfection of their adaptation to the offices for which their more obvious characters had indicated them to have been destined. He further appropriately observes, that if Dr. Buckland's reflections in his *Bridgewater Treatise* (vol. i., p. 249) were natural and just after a review of the external characters of the dental organs of the Iguanodon, their truth and beauty become more manifest as our knowledge of the subject becomes more particular and exact. That knowledge we have given in Professor Owen's own words, as the clearest that could be used. A reference to the work itself, and the accurate and highly finished engravings which illustrate it, will leave the palæontologist nothing to wish with regard to the dentition of the Iguanodon.

Professor Owen describes the fang of the tooth of HYLÆOSAURUS as subcylindrical, subelongate, and smooth; the crown as expanded, compressed, slightly incurved, and with the narrow sides straight and converging at a slightly acute angle to the apex. In all the teeth which the Professor had seen, these sloping sides showed the effects of attrition, the enamel being worn away and the dentine exposed. The tooth is described as consisting of a body of dentine covered by a thick coating of clear structureless enamel, and surrounding a small central column of true bone, consisting of the ossified remains of the pulp, which presents the usual characters of the texture of the bone in the higher reptiles. The dentine differs, like that of existing Lacertians, from the dentine of the Iguanodon in the entire absence of the numerous medullary canals which form so striking a characteristic of the latter reptile. The main calcigerous tubes are described as characterised by the slight degree of their primary inflections, and as continued in an unusually direct course from the pulp-cavity to the outer surface of the dentine at nearly right angles with that surface, but slightly inclined towards the expanded summit of the tooth. They are stated to be chiefly remarkable for the large relative size of their secondary branches, which diverge from the trunks in irregular and broken curves, the concavity being always turned to the pulp-cavity. In most parts of the tooth the Professor found the numbers of these branches obscuring even the thinnest sections. The ossified pulp exhibited the parallel concentric layers of the ossified matter surrounding slender medullary canals, interspersed with irregular, elliptical, radiated cells.

In the first group or subfamily of the typical or squamate Saurians (*Pleodont Lacertians* of MM. Duméril and Bibron) the teeth are solid, or without any internal cavity, and are described as very firmly anchylosed by their base to the alveolar groove upon the inner side of the jaw; so that the extremity of the tooth is slightly directed outwards. In the second group, or *Cœlodonts* of the same authors, the teeth are excavated by a sort of canal, and are less firmly fixed to the jaws, being applied vertically, like piles or buttresses, against the outer alveolar parapet, but not adhering by their base. The first group includes the genera *Crocodilurus, Thorictes, Neusticurus, Aporomera, Monitor, Ameiva, Cnemidophora, Dierodon, Acrantus*, and *Centropyx*; the second, *Tachydromus, Tropidosaurus, Lacerta, Ophiops, Calosaurus, Eremias, Scapteira, Acarithodactylus*, and *Psammodroma*. For the disposition and number of the teeth on the maxillary, intermaxillary, and pterygoid bones in the different genera, we must refer the reader to the work itself.

Professor Owen observes that one gigantic extinct species of Saurian Reptile [MOSASAURUS] has been found to agree with many of the existing species in the Lacertian, Iguanian, Anolian, and Scincoid families, in having the pterygoïd bones armed with teeth; but, he remarks, the maxillary teeth combine the pleodont with the acrodont characters; and the skeleton indicates a special adaptation for swimming and marine life. The dentition is described as eminently exhibiting the acrodont character; the teeth being supported on expanded conical bases anchylosed to the summit of the alveolar ridge of the jaws: no existing Saurian, observes the Professor, exactly parallels this mode of attachment of the teeth, either in regard to the breadth of the alveolar border, or in the relative size of the osseous cones to the teeth which they support. A shallow socket remains where the tooth and its supporting base are shed. The form of the teeth differs likewise from that of any existing Saurian hitherto observed; for they are pyramidal with the outer side nearly plane, or slightly convex and separated by two sharp ridges from the remaining surface of the tooth, which forms a half cone. The teeth, all of which are slightly recurved and smooth on their peripheral surface, are implanted on the intermaxillary, maxillary, premandibular, and pterygoid bones; the series placed on the pterygoïds are much smaller. 'The superior maxillary bone,' continues Mr. Owen, 'in the great cranium preserved in the Paris museum—the most celebrated fossil of the present species—contained eleven teeth. Cuvier calculates that the intermaxillary bone may have contained three teeth; meaning probably three on each side. The premandibular element of the lower jaw supported fourteen teeth; the number of the teeth thus approximating to that which characterises the *Varanus Niloticus*. They are arranged in a pretty close and regular series. There appear to have been eight teeth on each pterygoïd bone. In the mode and place of development of the successional teeth the Mosasaurus resembles the Iguanæ and most other Lacertians. In the great cranium above mentioned, germs of new teeth in various stages of growth are lodged in hollows of corresponding degrees of depth on the inner side of the bases of the adherent teeth, and have evidently owed the commencement of their formation to the mucous membrane which originally covered those supporting cones of the teeth in place. The attention of Camper was particularly arrested by the observation of this fact, which appeared the more singular to him, as this mode of dental succession, which is common in reptiles and osseous fishes, was not then known.'

Professor Owen, after quoting the passage from Camper bearing out the last proposition, thus continues: 'The crown of the tooth consists of a body of simple and firm dentine, invested with a moderately thick coat of enamel; the expanded base is composed of a more irregular mass of dentine, which, by its progressive subdivision into vertical columnar processes, assumes a structure resembling that of true bone; this part is covered with a layer of cement, which is continued as an extremely thin coat upon the enamel. The pulp-cavity generally remains open at the middle of the base of the crown of the tooth: irregular processes of the cavity extend as medullary canals into the conical base of the tooth; but no processes of the pulp-cavity are continued, as in the Iguanodon, into the substance of the coronal dentine. This substance consists, as in the Crocodile, of fine and close-set calcigerous tubes, arranged according to the usual law, and much resembling that of the tooth of the varanian monitor figured in plate 67. The calcigerous tubes have a diameter of $\frac{1}{16000}$th of an inch, with interspaces equalling about four of these diameters: their secondary curvatures and branches resemble those in the tooth of the *Varanus*.' The commencement of the subdivision of the mass of dentine, by the divergence of the calcigerous tubes from secondary centres, after quitting the main pulp-cavity, is shown in Mr. Owen's plate 69, *fig.* 3. 'The fibrous structure of the enamel is very conspicuous in the tooth of the Mosasaur: the lines to which this structure is due seem to be continued from the peripheral cells of the dentine; and they bifurcate repeatedly as they traverse the enamel. This subdivision of the pulp-cavity, and multiplication of centres of radiation for the calcigerous tubes, increase until the piles of dentine can be scarcely distinguished from the Haversian canals of the bone of the jaw, with which the root or base of the tooth is confluent. The gradual transition from the simple structure of the compact crown to the multifid dentine of the anchylosed base of the tooth was not known to Cuvier, otherwise he could not have supposed that the crown and base of the tooth of the Mosasaurus were formed by vital processes of so dissimilar a nature as to forbid him considering them as parts of one and the same body. Cuvier had originally described the expanded base of the tooth of the Mosasaur as the root of the tooth: but afterwards finding that the corresponding base became anchylosed by ossification of the remains of the pulp with the jaw, he conceived that it was incorrect to regard it as a part of a body which he believed to be an inorganic product and the result of excretion. The necessity under which Cuvier felt himself compelled to regard the crown and the base of the tooth of the Mosasaur as two distinct parts, is at once banished by the recognition of the principle that the processes of calcification are essentially the same at every part of a tooth, whether it be free or anchylosed; and that they are modified only, as I have shown in my memoir on the formation of the teeth of the shark (*Comptes Rendus*, December 16, 1839), according to the density of the part to be produced.'

A few vertebræ found in the English chalk-formations are generically if not specifically related to the Mosasaurus of Maestricht. Dr. Mantell, in his *Wonders of Geology*, notices the only teeth there found (Norfolk chalk) approaching in form to that genus, as belonging to an unknown reptile or sauroïd fish. Professor Owen remarks that the portion of the jaw to which these teeth were attached exhibits such a similarity of attachment as to leave no doubt of their near relationship, nor does he think it by any means improbable that this fragment of jaw and teeth may belong to the same species as the above mentioned vertebræ. He suggests that till this conjecture be refuted, the fossil may be indicated by the name of *Leiodon*, from the smoothness of the teeth which are about half the size of those of *Mosasaurus Hoffmanni*, but differ in having their outer side as convex as the inner side; their base is circular.

The teeth of *Geosaurus*, which appears not to be happily named, inasmuch as the large eyes defended by broad sclerotic plates indicate, as Professor Owen observes, that the sea was its dwelling-place, resemble those of the large *Varanians* in their compressed subrecurved crown, with a trenchant anterior and posterior edge, which likewise presents a fine and close dentation. A very fine fragment, we believe, the best known, is in the British Museum. Sœmmering's conjecture that Geosaurus might be a young Mosasaur is no longer held good, and Cuvier's observations on the difference of their teeth are acknowledged to be just. Professor Owen remarks that the form of the vertebræ of *Geosaurus* indicates its near affinity to the crocodilian group, and that the Argenton fossil crocodile presents the same subcompressed teeth with dentated margins as *Geosaurus*.

The *Varanians* form a family of scaled Saurians, including the *Monitors* of the Old World: some of the species come nearest in size to the crocodiles. This family, Professor Owen remarks, manifests its affinity to that group in the absence of pterygoid teeth, and in the number of successive tooth-germs which may be observed at the same time behind the fixed and functional teeth. Independently of these characters, the Varanians must, observes the Professor, excite our interest from exhibiting in some species a form of tooth which most nearly resembles that which characterises *Megalosaurus* and other very remarkable extinct terrestrial species of gigantic squamate Saurians.

In a small extinct species of Lizard from the gault and chalk formations, and for which Professor Owen proposes the name of *Raphiosaurus*, the teeth were awl-shaped, about three lines in length above the alveolar border, close-set, and equal-sized. Their rounded base was anchylosed to the alveolar groove, and their outer side attached to a well-developed external alveolar wall.

For the varieties in the form of the teeth presented by the existing Varanians we must refer to the work itself, observing only that Professor Owen points out the *Heloderm*, *Varanus Niloticus*, *Varanus arenarius*, *V. Timoriensis*, *V. Bengalensis*, *V. bivittatus*, *V. variegatus*, and *V. crocodilinus* as the principal species which exhibit such varieties.

Professor Owen commences the family of the *Thecodonts*, extinct Saurians which exhibit a mode of fixation of the teeth different from the *Acrodonts* and *Pleurodonts*, with the genus *Thecodontosaurus*, observing that these *Thecodonts*, which in other parts of their organization adhere to the squamate or Lacertine division of the order, have their teeth implanted in sockets, either loosely, or confluent with the bony walls of the cavity; and to this group the most ancient Saurians belong.

The THECODONTOSAURUS discovered by Dr. Riley and Mr. Stutchbury in the dolomitic conglomerate at Redland near Bristol, is, as well as their PALÆOSAURUS, also there found by them, allied in the form of the teeth to the typical Varanian Monitors, but Professor Owen remarks that they differ in having the teeth imbedded in distinct sockets: to this condition however, he observes, the *Varani* make an approach in the shallow cavities containing the base of the teeth along the bottom of the alveolar groove. But in the antient extinct *Thecodontosaurus* the sockets are deeper, and the inner alveolar wall is nearly as high as the outer one: the teeth present a close-set series, slightly decreasing in size towards the posterior part of the jaw. The number of teeth supposed to have been contained in each ramus of the lower jaw is supposed to have been twenty-one. 'These,' says Mr. Owen, 'are conical, rather slender, compressed and acutely pointed, with an anterior and posterior finely serrated edge, the serratures being directed towards the apex of the tooth; the outer surface is more convex than the inner one: the apex is slightly recurved: the base of the crown contracts a little to form the fang, which is subcylindrical. The pulp-cavity remains open in the base of the crown. In microscopic structure the teeth of the *Palæosaurus* closely correspond with that of the teeth of the Varanus, Monitor, and Megalosaurus. The body of the tooth consists of compact dentine, in which the calcigerous tubes diverge from the open pulp-cavity at nearly right angles to the surface of the tooth; they form a slight curve at their origin, with the concavity directed towards the base of the tooth, then proceed straight, and at the periphery bend upwards in the contrary direction. The diameter of the calcigerous tube is $\frac{1}{30000}$th of an inch. The crown of the tooth is invested with a simple coat of enamel.'

This examination, as Professor Owen remarks, satisfactorily establishes the distinction between the Saurian of the Bristol conglomerate and the reptiles of the new red-sandstone system in Warwickshire, described under the generic name of *Labyrinthodon*. [SALAMANDROÏDES.]

One of the two teeth of *Palæosaurus* found by Dr. Riley and Mr. Stutchbury is compressed and pointed, with opposite trenchant and serrated margins; but its breadth is much greater than its length; this they ascribe to a species which they name *Palæosaurus platyodon:* the other they refer to a species designated by them *P. cylindrodon.* The crown of *P. platyodon* measured nine lines in length and five lines in breadth, and is figured in *Odontography*, pl. 62 A, *fig.* 7. The portion of the tooth of *P. cylindrodon* shows a subcompressed crown traversed by two opposite finely-serrated ridges, and is five lines long and two lines broad.

The genus *Cladeiodon* (Owen) derives great interest from having been found in the same quarries of new red-sandstone (Keuper?) at Warwick and Leamington as contained the remains of *Labyrinthodon*. 'In their compressed form,' says Professor Owen, 'anterior and posterior serrated edges, sharp points, and microscopic structure, these teeth agree with those of the Saurian reptiles of the Bristol conglomerate. In their breadth, as compared with their length and thickness, they are intermediate between the Thecodontosaurus and the *Palæosaurus platyodon;* they are also larger and more recurved, and thus more nearly approach the form characteristic of the teeth of the *Megalosaurus*. From these teeth however they differ in their greater degree of compression, and in a slight contraction of the base of the crown. I propose therefore to indicate the genus, of which, as yet, only the teeth are known, by the name of *Cladeiodon*, and for the species from the Warwickshire sandstone the name of *Cladeiodon Lloydii*, in testimony of the friendly aid of Dr. Lloyd of Leamington, to whose exertions I owe the materials for the description of the teeth of the present genus, and the still more remarkable ones of the British species of Labyrinthodon, with which the teeth of the *Cladeiodon* are associated.'

Professor Owen retains the name of PROTOROSAURUS for the small species of Saurian found in the pyritic schists of Thuringia, which, he observes, like the dolomitic breccia near Bristol, rank as the oldest member of the new red-sandstone. Spener first described it as a sort of crocodile. (*Miscellanea Berolinensia*, 1710.) Cuvier, after elaborate investigation, came to the conclusion that it was a *Monitor* or *Tupinambis*, and Hermann von Meyer gave it the name of *Protorosaurus Speneri*. The name is retained by Professor Owen, because the species in question actually differs from the existing Monitors and other Lacertians by the same character which distinguishes the *Thecodontosaurus*, viz. the implantation of the teeth in distinct sockets. 'Of these sockets,' remarks Mr. Owen, 'the dislocated ramus of the lower jaw in Spener's specimen exhibits fourteen, which are of a square shape, with the angles rounded off, close-set, and sub equal. The teeth, of which eighteen may be counted in the upper jaw, are relatively longer, more slender, and more cylindrical than in the *Thecodon;* they are more or less broken; the most perfect of them measure three lines in length, and two-thirds of a line across the base; they are of a jet-black colour, and, being imbedded in a dark matrix, have not enabled me to determine whether the *Protorosaurus*, like the equally antient reptiles of the Bristol conglomerate, had the teeth armed with serrated ridges.' Professor Owen adds in a note, that besides the Thecodont type of dentition, the *Protorosaurus* differs from all recent Saurians, and resembles the Pterodactyle in the great relative size of the cervical vertebræ and the ossified tendons of the muscles of that region of the spine; it differs from all reptiles, except the extinct *Rachæosaurus*, in the bifurcate superior spines of the caudal vertebræ.

After observing that the compressed varanian form of tooth, with trenchant and finely dentated margins, which characterised the antient *Palæosaur* and *Cladeiodon*, is continued in the comparatively more recent and gigantic MEGALOSAURUS, and quoting Dr. Buckland's graphic description of the external form and renewal of the teeth (*Bridgewater Treatise*, vol. i., p. 237), Professor Owen informs us that they consist of a central body of dentine, with an investment of enamel upon the crown, and of cement over all, but thickest upon the fang. The marginal serrations are, he states, formed almost entirely by the enamel; and when slightly magnified, are seen to be rounded and separated by slight basal grooves: the smooth and polished enamel upon the sides of the crown presents a finely wrinkled appearance, and the remains of the pulp are converted into a coarse bone in the completely formed tooth. The dentine he describes as consisting of extremely fine and close-set calcigerous tubes, without admixture of medullary canals, radiating from the pulp-cavity at right angles with the external surface of the tooth; the primary curvatures corresponding with those of the calcigerous tubes in the monitor's tooth, but less marked, so that the tubes appear straighter. Their diameter was found to be $\frac{1}{20000}$th of an inch, with interspaces varying between two and three times that diameter; they dichotomise sparingly, but the number of minute secondary branches sent off into the intermediate substance is described as being very great. These secondary branches were seen to proceed at acute angles from the primary tubes, and the divisions of the tubes to become very frequent near the periphery of the dentine, the terminal branches dilating into or inosculating with a stratum of calcigerous cells which separates the dentine from the enamel. 'The highly organised nature of a tooth,' says Professor Owen, in concluding his observations on the teeth of this enormous extinct and carnivorous terrestrial lizard, 'is well illustrated in this example of one of the simplest of Saurian teeth, in which, in addition to the tubular and cellular modification of the dentine, there is also enamel, cement, and an internal coarse kind of bone. The dentition of the Megalosaurus, besides exemplifying on a larger scale the mechanical advantages of the varanian form of tooth, exhibits an interesting transitional character between the squamate and loricate types of Saurians, the distinct sockets making the approach to the crocodiles, while the raised external alveolar wall shows the retention of the lacertine structure.'

In the extinct Saurian from the oolitic formation at Neuffen in Würtemberg (*Thaumatosaurus oolithicus*, Meyer), Professor Owen found the teeth conical, slightly curved, straighter on the inner side of the crown, and implanted by a long and strong root, rather obliquely, in a deep socket. The base and basal portion of the crown presented a nearly circular transverse section, and the wide pulp-cavity in this part of the tooth exhibited an elliptical transverse contour; the tooth becomes slightly compressed towards the apex. Its implanted base is stated to be the broadest part of the tooth; the breadth of the crown to its height is as one to three; the crown is described as invested with a thin layer of enamel, the basal half of which is marked by longitudinal striæ; these striæ seemed to consist of folds of the enamel, which do not extend into the dentine. The successional teeth are noticed as penetrating into the interior of the fixed teeth in the progress of their development.

The teeth of *Ischyrodon*, a gigantic reptile from the Jura limestone of the canton of Aargau, are described as somewhat resembling those of the *Thaumatosaurus*, but the external longitudinal striæ of the crown of the tooth as being sharper and more elevated, and the enamel between the striæ as roughened by irregular linear risings; whilst the teeth of the *Pœcilopleuron*, an extinct reptile, also of gigantic dimensions, from the oolitic beds at Caen, has, according to the single tooth referred to that species, a more compressed crown than the teeth of *Thaumatosaurus*; the striæ are also described as wider apart, and the two diametral ones as developed into ridges which extend to the apex of the tooth.

Professor Owen had not, when he published the second part of his 'Odontography,' enjoyed the opportunity of examining the microscopical structure of an undoubted tooth of a **Pterodactyle**; but the dentition had been justly described by Cuvier as presenting nothing equivocal, the teeth being simple, conical, and nearly alike, as in the crocodiles, the monitors, and other lizards. Professor Owen remarks that the disposition of the teeth in the jaws, with wide interspaces, and their separate implantation in distinct sockets, are characters in which the Pterodactyle approximates to the extinct Saurian genera *Thecodon*, *Megalosaurus*, *Plesiosaurus*, and the Crocodilians. After describing the relative number of teeth in different species, Professor Owen observes that those figured in his plate 63 A., *fig.* 7, are referred by Dr. Buckland to the large species of Pterodactyle (*Pter. Macronyx*) discovered by the latter at Lyme Regis; but Professor Owen remarks that though they are implanted, like the teeth of other species of the genus, in separate sockets, in the breadth and shortness, lateral compression, and trenchant anterior and posterior margins of the protruded crown, they much more closely resemble the teeth of certain Scomberoid fishes, which are similarly implanted in the jaws. He further calls attention to H. von Meyer's observation that the jaw of a Pterodactyle from the lias at Banz, which he refers to the species *Macronyx*, contains the sockets of only fourteen teeth, whilst the fragment of jaw with the sphyrenoïd teeth from Lyme Regis above mentioned must have contained a much greater number. After noticing that some portions of the skeleton of a large Pterodactyle have been discovered by Dr. Buckland in the oolite at Stonesfield, Professor Owen goes on to state that a few teeth from the same formation in the collection of the Earl of Enniskillen bear the same proportion to these bones as do the teeth of *Pter. crassirostris* to its skeleton; they are, he informs us, long, slender, conical, slightly curved, and sharp-pointed; their base is smooth, the enamelled crown is marked with fine striæ converging obliquely upwards to a longitudinal line on the convex side of the tooth. These teeth vary from nine to fourteen lines in length, and are one line or one line and a half across the base.

In noticing the teeth of the **Enaliosaurians**, Professor Owen observes that those of the *Ichthyosauri* [**Ichthyosaurus**] have a simple, more or less acutely conical form, with a long and usually expanded or ventricose base or implanted fang, and that they are confined to the intermaxillary, maxillary, and premandibular bones, in which they are arranged in a pretty close and uninterrupted series, and are nearly of equal size. They consist, he informs us, of a body of unvascular dentine, invested at the base by a thick layer of cement, and at the crown by a layer of enamel, which is itself covered by a very thin coat of cement; the pulp-cavity is more or less occupied, in fully-formed teeth, by a coarse bone. He observes that the external surface of the tooth is marked by longitudinal impressions and ridges, but the teeth vary both as to outward sculpture and general form in the different species, for which differences, as well as their relative numbers, we refer to the work itself. The following is the result of Professor Owen's microscopic investigation of the teeth of *Icthyosauri Platyodon* and *intermedius*:—'The dentine has the same simple compact structure as in the teeth of existing carnivorous Saurians. The calcigerous tubes present a diameter of $\frac{1}{20000}$th of an inch, with interspaces of $\frac{1}{5000}$th of an inch. They radiate from the pulp-cavity, and from a line continued from its upper end to near the apex of the tooth, according to their usual course, towards the periphery of the tooth; they describe at their origin a graceful curve, the concavity of which is directed towards the base of the tooth, and then proceed in straight lines at right angles to the periphery of the tooth. The secondary curvatures or undulations of the tubes are more regular, more numerous, and more marked than in the crocodile's tooth; the tubes divide dichotomously many times during their course, and send off lateral branches obliquely into the clear intermediate substance, and principally from their concave side; the terminal divisions of the calcigerous tubes become less regular, appear to decussate and communicate, at their extremities, either directly with one another, by inosculating loops, or through the medium of minute cells.

'The enamel is a clear dense substance, presenting faint traces of a fibrous structure, the lines being vertical to the surface of the tooth.

'The coronal cement appears only as a line of substance more opaque than the enamel which it invests; it augments in thickness at the base of the tooth, where the radiated corpuscles or cells that characterise its structure are very conspicuous; the cement is inflected at each of the basal grooves, in the form of a short, straight, and simple vertical fold, into the substance of the dentine. The peripheral portion of the basal dentine is thus divided, to the extent represented in plate 64 B, *fig.* 3, into a corresponding number of processes; fissures of the pulp-cavity radiate to their bases, becoming there the centres of divergence of as many series of calcigerous tubes, which obey in their course the usual law of verticality to the external surface of the dentine. This structure can be seen only in a transverse section at the base of the tooth: its correspondence with that of the apex of the crown of the teeth of the Labyrinthodon will be obvious on comparing *fig.* 3, pl. 64 B, with *fig.* 1, pl. 63 B, and, as has been already stated, it gave the key to the nature and principle of the complicated labyrinthic interblending of dentine and cement, which was first observed in the great tusk of the *Labyrinthodon Jaegeri*.

'The remains of the pulp, after the formation of the due quantity of dentine, became converted, as in the pleodont lizards, by a process of coarse ossification, into a reticulate fibrous or spongy bone;* but it continues open at the crown after the basal part of the tooth is thus consolidated, as shown in the longitudinal section (pl. 73, *fig.* 8), wherein *a* is the pulp-cavity, filled with crystallized spath; *b* the ossified pulp at the base of the tooth. The radiated cellular corpuscles are very conspicuous in both this bone and the external cement.

'The chief peculiarity of the dental system of the Ichthyosaur is the mode of implantation of the teeth; instead of being anchylosed to the bottom and side of a continuous shallow groove, as in most Lacertians, or implanted in distinct sockets, as in the Thecodon, Megalosaur, or Pterodactyle, they are lodged loosely in a long and deep continuous furrow, and retained by slight ridges, extending between the teeth, along the sides and bottom of the furrow (pl. 73, *fig.* 9), and by the gum and the organized membranes continued into the groove and upon the base of the teeth.

'The germs of the new teeth are developed at the inner side of the base of the old ones. Mr. Conybeare has given a figure of a transverse section across the jaw-bone (reproduced at pl. 73, *fig.* 7), in which the new tooth (*c*) has penetrated the osseous substance of the base of the old tooth (*b*), and its point has nearly entered the remains of the pulp-cavity, which has continued open in the crown of the tooth (*a*).

From the circumstance of the consolidation of the base of the teeth in the Ichthyosaur, Mr. Conybeare infers that they were retained longer in the jaw than are the hollow teeth of the crocodiles; but the analogy of other Saurians, and the observation of two new teeth at successive stages of formation, at the base of an old tooth, prove that the succession of new sets of teeth was repeated more than once, though probably not so frequently as in the crocodile.'

The same author describes the teeth of the **Plesiosaurus** as conical, long, slender, and sharp-pointed, appearing to retain their internal cavity, as in the teeth of a crocodile: the very long round fang or implanted base contracts, in old teeth, as it sinks into the jaw, and terminates almost in a point. The chief distinction offered by the dental system between the *Ichthyosauri* and *Plesiosauri* is pointed out by Professor Owen as existing in the loose implantation of the teeth of the latter in separate alveoli. In this deviation from those of the Ichthyosaur, the Plesiosaur, observes the Professor, approximates to the crocodilian type, and this affinity, he adds, is likewise manifested in the unequal size of the teeth, and the development of some of the anterior ones into large tusks. They are described as being composed, like those of the Ichthyosaur, of a body of hard and simple dentine, covered at the crown by a coat of enamel and at the base by a coat of cement: but the latter is relatively thinner than in *Ichthyosaurus*, and is not inflected into the substance of the dentine. The crown is characterised by well-defined, narrow, elevated longitudinal ridges, terminating abruptly at different distances from the apex, to which however Professor Owen states that none of them extend. The calcigerous tubes in their general course were found to bear a considerable resemblance to the same parts in the Ichthyosaurus, but the primary curvature presents, Mr. Owen tells us, a more graceful sigmoïd line, from the inclination of the peripheral extremities of the tubes towards the apex. The diameter of the tubes at their origin is given at [illegible]th of an inch; their interspaces were found to equal five or six of their diameters; the secondary undulations were relatively wider than in the *Ichthyosaurus*, and the secondary branches longer and more bent; the tubes were seen to divide dichotomously several times in their course, the divisions, after a slight divergence, proceeding in the same parallel line with each other and with the main stem. The finer secondary branches dilated into extremely minute cells along tracts which ran parallel with the contour of the tooth itself, and occasioned the apparent alternation of opaque and clear layers observable in the section by transmitted light. The enamel presented the same fine fibrous structure as that of the *Ichthyosaurus*, but the mode of succession of the teeth differed, the Professor remarks, from that of *Ichthyosaurus*, in the growing tooth being developed in a cell at the inner side of the old socket, and affecting, by its pressure, the bone of the jaw rather than the tooth about to be displaced. Professor Owen further observes that, notwithstanding the approximation to the crocodilian type which the teeth of the Plesiosaurus make in their persistent pulp-cavity, there is not more than a single successional tooth in progress of development at the base of the tooth in use at any period; and that the dentition of the *Plesiosaurus* further differs from that of the crocodile, inasmuch as the new tooth, instead of emerging from the pulp-cavity of the old tooth, or even from the same socket, protrudes its apex through a distinct foramen at the inner side of the alveolus of its predecessor.

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* 'The tooth in these genera becomes completely solid, its interior cavity being filled up by the ossification of the pulpy substance.'—Conybeare, *loc. cit.*, p. 106.

Professor Owen proposes the subgeneric name of *Pleiosaurus* for a gigantic extinct reptile whose remains have been found in the Kimmeridge clay. The teeth are described as differing from those of *Plesiosaurus* in their greater relative thickness as compared with their length, and in the subtrihedral shape of their crown. The outer side is slightly convex, sometimes nearly flat; it is separated from the two other facets by two sharp ridges; these are more convex, and the angle dividing them is often so rounded off, that they form a demi-cone, and the shape of the tooth thus approximates very closely to that of *Mosasaurus*, with which it is equal in size, but from which it is readily distinguished even when the crown only is preserved, by the ridges which traverse the inner or convex sides; the outer flattened surface alone being smooth. The long fang of the perfect tooth at once removes it from the *Acrodonts* and allies it with the *Thecodonts*, among which it approaches nearest, in the superficial markings of the crown, to *Plesiosaurus*. The vertebræ of the neck are so modified that the peculiarly elongated proportion of this part of the spine, which characterises the typical *Plesiosauri*, is exchanged for one that much more nearly approaches the opposite condition of the cervical region in the *Ichthyosauri*; thus presenting an abrogation of the main characteristic of the *Plesiosauri* combined with the more crocodilian proportions of the teeth of this *Pleiosaurus*, of which a fine specimen (*Pleiosaurus brachydeirus*, Owen) from Market-Raisin is preserved in Dr. Buckland's collection at Oxford, consisting of considerable portions of the upper and lower jaws.

'The teeth,' says Professor Owen, 'are arranged in separate sockets, in a close and regular series, along the alveolar borders of the intermaxillary, maxillary, and premandibular bones. Twenty-six sockets may be counted on the most perfect side of the upper jaw, but the series is evidently incomplete posteriorly. An interspace not quite equal to the breadth of a socket divides the fourth from the fifth tooth, counting backwards, and the jaw is slightly compressed at this interspace; the four anterior teeth, thus marked off, occupy the slightly expanded anterior extremity of the upper jaw, but do not present the disproportionately large size which characterises the anterior teeth in the true Plesiosaurs. After the fifth tooth the sockets progessively increase in size to the twelfth tooth, and, from the fourteenth they begin gradually to diminish in size; becoming, beyond the twentieth tooth, smaller than those at the fore part of the jaw.

'The alveolar septa are narrow, and are thinned off to an edge, which is lower than either the outer or inner walls of the sockets: these walls are equally developed. A line drawn transversely across any of the twelve anterior sockets would be transverse to the jaws, but in the remaining sockets it would incline obliquely from without, inwards and backwards. The transverse diameter of the thirteenth socket is one inch, six lines; its antero-posterior diameter is one inch, eight lines. The extent of the alveolar series is nearly three feet; the breadth of the palate at the twenty-sixth tooth is nearly one foot; the breadth of the upper jaw at the third tooth is four inches, three lines; the breadth of the socket of that tooth is one inch, three lines.

'In the lower jaw of the specimen in the Oxford Museum the posterior extremity of the dental series is complete, but not the anterior one; thirty-five teeth are present in each premandibular bone. The first, from its large size, I conclude to have been received into the slight concavity at the side of the upper jaw where the diastema separates the fourth and fifth teeth; there are probably therefore thirty-eight teeth on each side of the lower jaw; counting backwards, on this supposition, the teeth begin to diminish in size beyond the fifteenth, and at the posterior extremity of the series the sockets are less than half an inch in diameter; in their close arrangement and position they correspond with those of the upper jaw.'

The teeth which are preserved in this magnificent cranial fragment present the characters described at the commencement of this section; the outer smooth surface of the crown of a tooth of the lower jaw is represented at pl. 68, *fig.* 5; the inner surface of two of the teeth of the upper jaw is represented at 5′ and 5′ : the inserted fang of each of these teeth is four inches and a half in length, the entire tooth being thus seven inches in length. The ridges which divide the outer from the inner surface of the tooth subside at the base of the crown; the fang is smooth; it assumes a subcircular form, gradually expands for about half its length, and then contracts to its termination, but this is always less pointed than in the fully-formed teeth of the true Plesiosaur. In the old teeth with the elongated fang, the pulp-cavity remains open, as in the Plesiosaurian teeth; it presents at the expanded part of the fang a narrow elliptic transverse section. In a tooth of the present species, six inches and a half in length, from the Kimmeridge clay at Shotover, the diameter of the persistent pulp-cavity was thirteen lines. In this tooth the flattened surface is polished, but marked with minute shallow wrinkles; one of the ridged surfaces which stood at right angles to the preceding, was traversed by eleven well-marked linear ridges, of unequal length, separated by smooth interspaces of about three times the breadth of the ridges; the third surface, which formed an acute angle with the smooth outer surface, was traversed by twelve ridges. These ridges on the inner surfaces of the tooth slightly incline towards the rounded angle dividing these surfaces; they terminate abruptly; some cease half way from the apex of the crown; about ten are continued to within half an inch of the apex, which is smooth; the two ridges which divide the flat or smooth side from the ridged surfaces of the tooth are alone continued to the sub-acute apex of the tooth.

'The teeth of the Pleiosaur present varieties of form as well as of size; the rounding off of the angle between the ridged surfaces has been already alluded to; the smooth outer surface is sometimes so convex, that the transverse section of the tooth is more elliptical than triangular. All the teeth of the Pleiosaur are slightly bent inwards and backwards, but the smaller posterior teeth are most recurved, and have the sharpest apex; in the crown of these teeth, also, the ordinary rounded or elliptical form of the cone is most nearly attained; but the distinction of the smooth external surface and the ridged internal surfaces of the crown of the tooth is retained, and would suffice to characterise any of these teeth if found detached.

'The teeth of the Pleiosaur consist, like those of the Plesiosaur and Crocodile, of a central body of compact dentine, with a coronal investment of enamel, and a general covering of cement, of extreme tenuity upon the crown, but thicker upon the base of the tooth.

'The dentine consists of fine calcigerous tubes, without admixture of medullary canals; the arrangement, division secondary undulations, and branches of the calcigerous tubes correspond so closely with those of the teeth of the Plesiosaur, as to render a particular description of them unnecessary.

'The germs of the successional teeth are developed at the inner side of the bases of the old teeth, but do not penetrate these teeth; the apices of the new teeth make their appearance through foramina situated at the inner side, and generally at the interspace of the sockets of the old teeth. Here therefore, as perhaps also in the Pterodactyle, the growing teeth may be included in closed recesses of the osseous substance of the jaw, and emerge through tracts distinct from the sockets of their predecessors; but this is an exceptional condition of the reproduction of the teeth in Reptiles.'

For the interesting details of the dentition of the *Crocodilians* [CROCODILE], we must refer to the work itself—one of the most important to the general physiologist and palæontologist that has yet appeared; and the reader will now have before him a general review, collected therefrom, of the various modifications of the teeth in the whole of the Saurians, taking that term in its largest acceptation.

We now have to examine the other parts of the skeleton of the Saurians in the more restricted sense mentioned towards the commencement of this article. That of the *Enaliosaurians* is noticed in the articles ICHTHYOSAURUS and PLESIOSAURUS; that of the Crocodilians, under the article CROCODILE; and we shall find, as in other departments of the animal kingdom, a wonderful adaptation of the organization to the progression and habits of life of the animals. In the extinct Pterodactyle, we have, more especially in the anterior extremities, a modification in the development of the bones, to enable the animal to move through the air with a true flight. In the great mass of the terrestrial Saurians, the bones of the extremities are elongated, to facilitate progression on the earth, on trees, or even, as in the case of the Geckos, on smooth walls and ceilings. When we come to the aquatic groups, we have in the Crocodilians a more compact form of the bones of the hand and foot, but still adapted to occasional progression on land, till at last, in the Enaliosaurians, the short, compact, and compressed bones of the extremities become mere paddles to row the body through the water, like those of the tortoises among the Reptiles, and of the seals and whales (in the latter as far as the anterior extremities are concerned) among the Mammiferous animals.

Cuvier remarks that the study of the vertebræ of the living Saurians is highly necessary, in order to a recognition of the numerous fossil bones belonging to this family, and he thus proceeds to describe those of the former:—The atlas of the *Monitor* is a ring composed of three pieces; two upper ones united to each other at the dorsal part, notched in front and behind for the nerves, and one lower piece. The anterior surface of the axis (*dentata*), or rather of that portion of it which is analogous to the odontoïd, penetrates in the ring of the atlas and fills nearly half its width, leaving always, in front, a concavity for the condyle of the head. Below, on the junction of the atlas, of the odontoïd, and of the body of the axis, is a triangular piece which gives off a pointed hook directed backwards. The axis is compressed; its annular part takes, above, the form of a longitudinal pointed crest; its anterior articular facets have their plane turned outwards; the posterior ones have them downwards; the body terminates in a transverse convexity of a kidney shape; on each of its lateral surfaces is a small and but slightly projecting crest, which has, towards its anterior third, a small point; below, there is a crest, under the posterior part, which is enlarged backwards. The sutures which distinguish the annular part of the body are soon effaced; but for a long period a small epiphysis may be seen at the posterior point of each of the two crests. The five succeeding vertebræ resemble the axis, excepting that they are without an odontoïd; but their anterior surface has a concavity proportioned to the convexity of the preceding vertebræ, their dorsal or spinous crest or process is elevated and shorter, and their transverse processes enlarge slightly and present a convex facet for the support of the cervical rib. The lower crest exists; and this is what distinguishes the cervical from the dorsal vertebræ, the body of which last is even below, with the exception of the three first, which have each a tubercle becoming gradually less and less. At the point of these crests is an epiphysis, which in the other subgenera forms the crest by itself. The dorsal vertebræ after the twelfth have always a squared spinous process, an anterior concave and a posterior convex surface, both of a kidney-shape, horizontal articular apophyses, the posterior looking downwards, the anterior upwards; and on each side under the anterior apophysis, by way of a transverse apophysis, a vertical oval-shaped tubercle for supporting the rib. The number of these vertebræ are twenty-two, there being no lumbar vertebræ; for there are ribs from the neck to the pelvis amounting to twenty-seven pairs, including the five cervical, but the first and the last of these ribs are very small. The first pair of ribs is attached to the third cervical vertebra. The five first pairs are not united by means of cartilages to the sternum, and on this circumstance Cuvier relies to distinguish the cervical vertebræ, which, adding the atlas and dentata (these last having no ribs), makes their number seven, as in the crocodiles and mammals generally. The three first dorsal ribs only are attached to the sternum; the seventeen succeeding ones are false ribs. Cuvier remarks that the total absence of lumbar vertebræ appears to him a general rule in the family of Saurians.

There are two sacral vertebræ in the *Monitor*. The first has, in lieu of a small tubercle, a large apophysis convex externally, and presenting to the *ossa ilii* an articular surface notched behind, and of a horse-shoe shape. The second has also a large apophysis, but simply widened and flattened horizontally. The caudal vertebræ after the eighth, are very numerous (seventy, eighty, and more); they may be easily recognised by their spinous and transverse apophyses or processes, which are long and narrow, and their articular apophyses or processes, which are nearly vertical, the anterior looking inwards, the posterior outwards; and also by having on their lower surface, towards the hinder part, two small tubercles for supporting the chevron bone, which occupies the place of a lower spinous process. These two small tubercles are placed more forward in the Monitors than in the other subgenera; for in the latter they touch the posterior articulation, so that the chevron bone appears to be attached to the vertebræ. All the caudal vertebræ of the Monitor have, like the preceding, the anterior surface concave and the posterior convex, and they go on diminishing in proportion as they approach the extremity of the tail, their prominences finishing by being reduced almost to nothing.

In the *Sauvegarde* of America, Cuvier found the lower crests of the cervical vertebræ showing themselves as epiphyses, or even separate little bones attached on the articulation of two vertebræ, but which ended in being soldered to the anterior one.

The cervical vertebræ, determined by the anterior false ribs, are eight in number, that is to say, there are six pairs of these false ribs, and this number is found in many other subgenera, particularly in the Iguanæ, the Basilisks, the Lizards, the Geckos, the Anolides, the Agamæ, and the Stelliones. But Cuvier remarks that it should be avowed that the two, and sometimes the three last ribs, though they do not reach to the sternum, yet are placed under the shoulder, and concur in the formation of the thorax, so that the vertebræ which support them may be placed among the dorsal, which would reduce to five the number of vertebræ really belonging to the neck. In the ordinary Lizards, the Scinks, and slightly in the Anolides and the Geckos, the cervical ribs attached to the fourth, fifth, and sixth vertebræ are singularly compressed and widened at their free extremity. The differences which characterise the vertebræ of the different subgenera, independently of what Cuvier had already remarked as to the position of the tubercles of the caudal vertebræ for the chevron bones, especially consist, he informs us, in the respective length and stoutness of their bodies, and the respective length and width of their apophyses. The Iguana has the spinous processes of its dorsal vertebræ less lofty, and cut, as it were, more obliquely. The bodies of its caudal vertebræ are more elongated, so that with a less number they form a greater length. Their spinous processes decrease more rapidly. The Basilisks have very nearly the characters of the Iguanæ, but their dorsal spinous processes are high and narrow, as well as those of a part of their tail. The Agamæ have also the dorsal spinous processes high, straight, and narrow; but the Stelliones have them low. In the Lizards they are tolerably high, but directed somewhat obliquely backwards.

Cuvier considers it a very interesting fact that a great part of the caudal vertebræ of the ordinary lizards are divided in their middle vertically into two portions, which separate very asily, even much more easily than the vertebræ at the oint of their articulation, and this for the simple reason that he articulation is complicated, formed by many apophyses, nd strengthened by ligaments, whilst the solution of connuity of which he speaks is only retained by the periosteum and the surrounding tendons. It is probably on account of this peculiarity that the tails of lizards break so asily. Cuvier further states that he has observed this pecuarity in the *Iguanæ* and the *Anolides*, and he is of opinion hat vestiges of it would probably be found in all the species where this rupture of the tail is a common occurrence. Every one knows, adds Cuvier, that the tail shoots out again fter having been broken, but neither the skeleton nor its nteguments are, in that case, the same as before the rupure. The scales of the skin are generally small, without idges and without spines, though they may have had the ontrary qualities in the original tail; and internally, instead f the numerous vertebræ, with all their apparatus of apophysis and ligaments, there is nothing but a long cartilaginous cone of one piece, which only presents annular wrinkles, numerous indeed, but scarcely at all elevated.

The *ribs* of the Saurians are slender, round, and the anerior ones only have the costal head slightly enlarged and ompressed. Cuvier had never seen any of them with a ivision at their upper extremity into a head and tubercle. The anterior ribs of the Monitors are a little more widened n the upper part than those of other Saurians. Instead of hose simply ventral ribs which are seen in the crocodile, many subgenera, especially in the *Polychri*, Anolises, and Chameleons, after the ribs which are united to the sternum, ave others which unite mutually with their corresponding ib, and thus surround the abdomen with entire circles.

The *sternum* of the Saurians, taken together with their *houlder*, forms, says Cuvier, a kind of cuirass for the heart nd large blood-vessels. It is more complicated than in the rocodiles, and formed upon a plan very different from that f the tortoises. It consists essentially of a long, narrow, depressed bone, which gives off anteriorly two branches directed to each side, more or less recurrent, according to the pecies, and between which its point passes sometimes to dvance more forward under the neck. This bone penerates with its posterior part into a cartilaginous plate of a rhomboïdal shape, which has two sides forward and two backward, and which often shows traces of a longitudinal livision into two portions. Its interior sides are continued with the edges of the anterior part of the bone, but in divaricating to the right and left. They are sometimes ossiied, particularly their edge, which has a groove, in order to give support, like a mortise, to the sternal edge of the clavicular bone. The posterior sides of the rhomboïdal cartilage serve for the insertion of the false ribs. So far there is no great difference in this part of the organization from that of the crocodile, except in the anterior branches of the elongated bone, which give it the form of a T, of an arrow, or of a cross, according to the species; but a more considerable difference is apparent in the development of the coracoïd bone, and in the constant presence of a clavicle more or less large. The coracoïd bone, as in the crocodiles, the tortoises, and all the animals which have a true arm, concurs in the formation of the glenoïd cavity, and in the true Saurians affords nearly half of it. Widening more than the bony plate of the shoulder-blade, it proceeds to articulate itself to the sternal rhomboïd by a wide edge, which takes the form of the blade of an axe; but its peculiarity consists in the giving off one or two apophyses, by means of which it supports a great cartilaginous arch which passes on the slender and advanced bone of the sternum, and lies across that of the coracoïd bone of the other side. Cuvier observes that we should remark that in this singular crossing, which is to be found even in the lowest batrachians, it is generally the cartilage of the right side which passes to that of the left. There is always a small hole pierced for the vessels in the neck of the bone, between its apophyses and its glenoïd cavity. The apophyses, moreover, which proceed to join the demicircle or cartilaginous disk, leave one or two oval apertures between them, which trench on the demicircle, and are only closed by a membrane. This cartilaginous demicircle acquires consistence and firmness by age, though not the hardness of the other bones. It hardens by the accumulation of small calcareous grains, as is the case with the bones of the chondropterygian fishes. It is to this, observes Cuvier, that the bony piece which adheres to the coracoïd bone of the *Ornithorhynchus* and *Echidna* [Ornithorhynchus, vol. xvii., p. 30] has been compared; and, in fact, this piece is placed like the cartilage, and crosses with its opposite on the first bone of the sternum, which is also in the shape of a T; but in this apparatus the great membranous apertures which notch the similar development in the Saurians are wanting.

The *scapula*, or shoulder-blade, produces the other part of the glenoïd facet; it goes on, as ordinarily, enlarging on the side of the thorax and towards the back; and at about a third or the middle of its length stops short, but is continued in a single portion, which is generally cartilaginous, or which, when it is ossified, which frequently happens, becomes so in a different manner, and with another texture, like the cartilage adhering to the coracoïd bone. In the case of ossification, the scapula is always divided into two bones.

The *clavicle* rests on one side against the slender bone of the sternum, or against its lateral branch, and often also it reaches to the opposite clavicle; on the other side it proceeds to rest against the anterior edge of the scapula, either against the osseous portion or that which remains longer cartilaginous, and which often presents a tubercle or small crest for its reception. Sometimes the bony scapula gives off an apophysis which goes to sustain the body of the clavicle, but this is all that it presents as a slight resemblance to an acromion: the tubercle of the cartilaginous part resembles that process much more. Such is the general structure among the Saurians; nor does it differ much from that of the crocodiles, except in the presence of a clavicle, and of that cartilaginous appendage which enlarges the coracoïd bone.

The T-formed or arrow-shaped bone may also, in strictness, be compared to the unequal bone of the *plastron* of the tortoises, which sometimes takes this shape, and some think that the two first equal pieces of this plastron are the representatives of the clavicles; the second, of the cartilaginous appendages of the coracoïds; the third, of the rhomboïdal piece, which, even in the lizards, often presents a longitudinal furrow, indicatory of division; and, finally, the fourth, of the appendages, which sometimes support the two last cartilages of the ribs.

The differences observable among the various subgenera are hardly of sufficient importance to justify the occupation of space here, and we refer the reader to the *Ossemens Fossiles*, from which the osteology of the skeleton here given is taken, and in which Cuvier details those differences. (Vol. v., pt. 2, p. 291.)

The *pelvis* of the Saurians (Cuvier takes the *Monitor* as the example) is composed of three bones, which concur, as in the viviparous quadrupeds, to compose the cotyloïd fossa. Its upper part is formed by the *ossa ilii;* its neck is wide and short; its spinal part, instead of being directed forwards, as in the viviparous quadrupeds, or of being rounded as in the crocodile, runs obliquely backwards in the form of a narrow band, and has only a small point in front. The pubis and the ischium are each united to its opposite in the median inferior line; but the pubis is not joined to the ischium, and the two oval holes are only separated by a ligament. Their neck is wide, short, and flat. That of the pubis is pierced with a rather large hole, and its anterior border produces a point which is recurved downwards and outwards. Cuvier adds that the pelvis in the different subgenera is especially distinguished by the symphysis of the pubis, which is formed by a rather wide truncature in the Monitors, and even slightly in the Sauvegardes; but only by a narrow point in the majority of others. The Chameleon differs from all the others in its narrow *ossa ilii,* which proceed perpendicularly, in widening slightly to attach themselves to the spine. These *ossa ilii* are still further distinguished by a triangular cartilage, analogous to that of the shoulder-blade. The symphysis of its pubis is formed by a truncature, and there is no lateral point. Vestiges of a pelvis exist in Ophisaurus and the Blindworm [Orvets], which consist of a small os ilium, with a rudiment of an ischium, but without a symphysis. [Scheltopusik.]

The *cylindrical bones* of the Saurians exhibit the following characters:—The *humerus* agrees very much in form with that of Birds. Its upper head is compressed, to answer to the hollow fosset which the shoulder-blade and coracoïd bone together present to it. Its lower pulley is formed of two projecting rotatory portions, entirely rounded, the external of which is the least developed. The internal condyle also projects more than the external, the deltoïd crest produces an angle more projecting forwards, and its posterior tuberosity is less hooked. In these two last respects it more resembles that of the crocodile; but it has, in general, all its articular surfaces much better defined. But the humerus of a lizard may always be distinguished from that of a bird, because the former is not hollow, nor pierced with holes for the admission of air into its interior. The *ulna* of the Saurians is compressed and trenchant on its radial edge. Its sigmoïd facet is oval, and its olecranon projects but little; its carpian head is also oval and uniformly convex. The *radius* is delicate; its upper head is oval and concave; its lower, which is slightly convex, presents to the first bone of the carpus a rounded tubercle and a fosset of a crescent-shape. The *femur* in its upper part resembles that of the crocodile much more than that of birds, and this has reference to the direction of the foot in reptiles. Its upper head is compressed and curved in front, and has its trochanter on the tibial side placed nearer to the head of the bone than in the crocodile, much more projecting, and of a compressed form. The lower head of the femur, on the contrary, much resembles that of birds, especially in the small hollow on the peroneal side for the head of the fibula. The *patella* is very small, often hardly visible. The leg is always composed of two bones, of which the *tibia* is the largest. Its upper head is triangular, as ordinarily; its lower is transversely oblong and flat. The *fibula* of the Monitors is flattened and widened below, where it unites to the tarsus by a narrow line. In the Iguanas and the greater part of the other genera it is nearly of a size throughout, slender, with its upper head compressed, and its lower demi-oval and slightly oblique.

The *bones of the fore and hind feet* in the Saurians consist of a *carpus* composed of nine bones, like that of the tortoises, and Cuvier remarks that its composition may equally be compared to the *Simiadæ*. In the first row are a radial bone, a cubital bone (rather large), and a pisiform bone fitted against the lower part of the ulna. In the lower row are five small bones, disposed in a curve and answering to the five metatarsal bones, and a ninth, placed between the two large bones of the first row, and the first, second, third, and fourth of the second row. The metacarpals of the thumb and little finger are rather shorter than those of the other three fingers. The number of phalanges amounts to two for the thumb, three for the fore finger, four for the middle finger, five for the ring finger, and three for the little finger. The *tarsus*, like that of the crocodile, has only four bones. In the first row are two: 1, a tibial bone, which extends also partially under the fibula, and presents a facet to it; it is irregularly rectangular, wider than it is long, thick on its internal border, and presenting in its profile some relationship to the astragalus of a Ruminant; 2, a fibular bone, smaller and soon uniting itself into a single piece with the preceding, on the same plane with which it is. In the second row are also two; one larger, triangular on its anterior surface, and stouter backwards, where it articulates with the two of the first row, and supports the metatarsals of the fourth and fifth toes; the second, smaller, placed between the preceding and the metatarsals of the third and second toes. This last also slightly touches upon the astragalus, which only supports the metatarsal of the great toe. The four first metatarsals are slender and nearly straight; they go on elongating to the fourth; the fifth is short, widened, and recurved on its upper head towards the great bone of the second row, to which it is articulated by the side. The great toe has two phalanges; the second toe, three; the third, four; the fourth, five. It is this, which is the longest, that gives to the foot that elongated and unequal form which characterises it in the lizards. The fifth, which is nearly as short as the great toe, has, like the third, four phalanges. Cuvier remarks that in the ordinary position of the hind feet of the Saurians, that is, with the toes directed backwards, the tibia and great toe are at the external border of the foot, and the little toe is at the internal border. The ungueal phalanges of all the feet are trenchant, arched, and pointed. This description, observes Cuvier, allowing for some differences in proportion, answers for all the subgenera which have well-developed feet, with the exception of the Chameleons alone and some peculiarities relative to the toes in certain Geckos: and even in the Chameleon it is in the proportion of the bones of the carpus and tarsus, rather than in their number and arrangement, that the difference appears. The mode in which the bones of the feet are grouped in the chameleon in an inverse manner, that is, the great and little toes of all the feet together and directed inwards, and the three others also together and directed outwards (a peculiarity observed by Aristotle), will be seen in the cut in the article CHAMELEONS.

We have dwelt here at some length upon the dentition and osteology of the *Saurians*, not only because of the interest attached to this great group of animals on its own account, but in consequence of the necessity of a full understanding of this part of their organization by those who study that branch of palæontology more particularly conversant with the extinct Saurian forms—forms including the most gigantic proportions and the most heteroclite shapes, that were alive countless ages ago, when as yet man was not, and were absolutely swept away from the face of the earth thousands of years before he stood upon it. Of all the fossils which remain to remind the observer of the wreck of a former world, these, from the antiquity of the strata in which they are found, present perhaps the most striking materials for illustrating the antient history of our planet.

The other parts of the organization of the Saurians will be found in detail, where necessary, under REPTILES and the different articles relating to the families and genera. We shall here only observe that their heart, like that of the tortoises, is composed of two auricles and one ventricle, which is sometimes divided by imperfect partitions. Their ribs are moveable, and can be raised or depressed for the purposes of respiration. Their lung extends more or less towards the hind part of the body, and often penetrates into the abdomen, whose transverse muscles glide under the ribs and even towards the neck to embrace it. Their generation, with few exceptions (*Zootoca*, for instance), is oviparous, and the eggs have a more or less hard shell. In some (*Chameleon*, for instance) it is a mere tough calcareous skin, and this is its general condition. The coitus is complete, and effected sometimes by means of two intromittent organs and sometimes by means of one only. The young come into existence in the same form which they retain through life. The toes are armed with nails, with very few exceptions, and the skin is either covered with scales more or less serrated, or at least with small scaly grains. All have a tail more or less long, nearly always thick at the base. The greatest number have four feet, some two only, and a few mere rudiments not apparent externally.

FOSSIL SAURIANS.

Besides the notice of fossil Saurian forms in the course of this sketch, a detailed account of most of the extinct genera is given under their several titles in this work.

SAURIN, JOSEPH, a French mathematician and natural philosopher, was born in 1659, in the South of France at Courtaison in the principality of Orange, where his father was the minister of a Protestant congregation. The young man was educated in the principles of the Reformed Church, and before he was twenty-four years of age he was called to the ministry at Eure in Dauphiné. Possessing an ardent temperament and a bold eloquence, he soon distinguished himself as a preacher; but, in one of his sermons, happening to censure too freely the measures taken by government for diminishing the privileges of the Protestants, he was obliged to retire into the canton of Bern, where he obtained the curacy of Berchier in the bailiage of Yverdun. Certain circumstances, which have been differently related by his friends and enemies, obliged him soon afterwards to take refuge in France, where, in [illegible], he abjured the doctrines of the Calvinists. His own account is, that having refused to sign the *Consensus of Geneva*, condemning the doctrines of the French Protestant theologians respecting original sin and the vowel points of the Hebrew text, he was vehemently censured by a party in the church. He adds that the harsh treatment to which he was subjected on this account led him to suspect the sincerity of his adversaries' sentiments in religion; and that an attentive study of the works of the celebrated Bossuet convinced him of the errors of Protestantism. On the other hand it is stated that Saurin, having been guilty of theft, withdrew to France in order to avoid the prosecution with which he was threatened: this accusation, true or false, is founded on a confession which he is said to have made in a letter dated 1689, and printed in the 'Mercure Suisse,' and upon some documents relating to the criminal process instituted on the occasion, which are stated to have been preserved in the Chancery of Bern.

After his recantation, having, through the interest of Bossuet, obtained a pension from the king (Louis XIV),

devoted himself to the study of the mathematical
; and between 1702 and 1708 he wrote several
which were published in the 'Journal des Savans.'
same time he was engaged in a controversy with
ns on the subject of the vortices of Descartes, and
lle concerning the infinitesimal calculus. He be-
member of the Académie des Sciences in 1707, and
1709 and 1727 he enriched its 'Mémoires' with
us mathematical and philosophical papers, among
re some containing profound investigations relating
urves of swiftest descent, and dissertations, con-
y to the Cartesian hypothesis, on the force of

n's scientific pursuits were interrupted for a time by
risonment which he suffered in consequence of an
on brought against him by J. Baptiste Rousseau,
was the author of certain profane and defamatory
ith the composition of which Rousseau himself had
arged. As the accusation could not be substantiated,
gment of the court was given against the accuser,
consequence, was banished from France, while the
was liberated. [ROUSSEAU, J. B.]
n died December 29, 1737, of a lethargic fever. He
to have been a man of lofty and vigorous mind, but
d that he was capable of using any means for ob-
the ends which he had in view; and it must be ob-
that the cause of his departure from Switzerland,
abjuration of his first religious opinions, have
en satisfactorily explained.
RIN, JAMES, an eminent French Protestant di-
s born at Nismes, January 6, 1677. He was the
lawyer, of the same persuasion, who quitted France
e revocation of the Edict of Nantes, and retired ap-
to Geneva. At least it is known that James
finished his education there, after having borne
r a short time in the English service. In 1701 we
pastor of the Walloon church in London, whence,
r years, he repaired to Holland, and establishing
at the Hague, remained there in the exercise of the
until his death, December 30, 1730. That event is
ave been hastened by mortification at the disputes
lesiastical censures in which he was involved by his
tation sur le Mensonge Officieux,' on falsehoods
re expedient, a delicate subject to handle.
preacher he is ranked at the head of the French
nts. 'Depth of thought, force of argument, skilful
ion of parts, strength of drawing, bursts of pathos,
turns, points which strike the imagination and
e heart, majestic and imposing simplicity like that
criptures, are the characteristics of his eloquence.'
the criticism of a French biographer.
ublished five volumes of sermons, to which seven
were added after his death: the first portion is
the best. His other chief works are, 'On the State
tianity in France,' and 'Discourses, historical, theo-
and moral, on the principal events of the Old and
stamentsments,' 2 vols. fol. (known as Saurin's Bible), to
our volumes by other hands were added after his
In these is contained the 'Dissertation on Falsehood'
oticed. Six volumes of his sermons have been trans-
to English.
her French Protestant divine of some note is **ELIAS**
, brother of Joseph Saurin the mathematician, no
apparently to James Saurin. He also settled in
l: he was born in 1639, and died in 1703.
RO'PHAGUS. [SHRIKES.]
'ROPHIS, Fitzinger's name for a genus of Li-
elonging to the group of *Chalcidian Lizards*, or
ur Saurians (Section PTYCHOPLEURES), of MM.
l and Bibron.
ric Character.—Tongue of an arrow-head shape,
ts anterior half, slightly notched in front, marked
evron folds above, and offering squamiform im-
papillæ towards its point. No palatal teeth. Inter-
y teeth small, conical, simple and pointed. Maxil-
th stronger, subcylindrical, straight, with an ob-
ointed crown. Nostrils lateral, each circumscribed
plates, one naso-rostral, one naso-frenal, and the
erior-labial. Eyelids. Membrane of the tympanum
d within the auricular border, which has in front a
ercular scale. Temples scutellated. Fore-feet very
ngated, each terminated by four short, unguiculated,
compressed toes, which are smooth below. Femoral pores. A furrow on each side along the neck and the trunk.

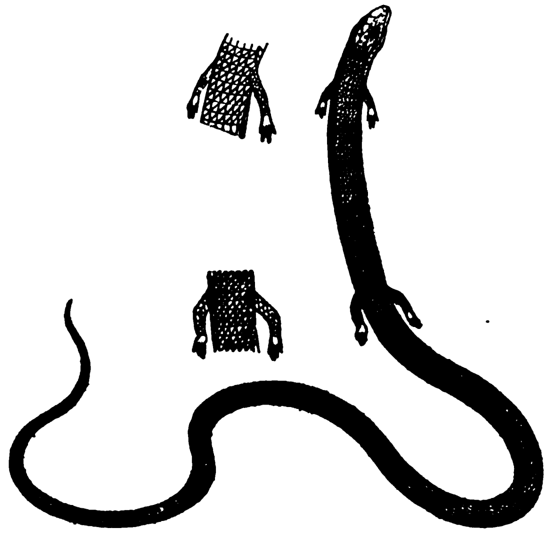
The type of this genus is the *Lacerta tetradactyla* of Lacépède.

Description.—No fronto-inter-naso-rostral plates. Fronto-parietals sometimes intimately soldered to the parietals. One inter-parietal. Auricular lobe very small. No scales between the submaxillary plates of the second pair. Dorsal scales striated, with a small keel in the middle. Fourteen longitudinal rows of scales from the lower part of one side to the other. Six longitudinal bands of ventral lamellæ. Four or five femoral pores on each side. Upper part of the head yellow, sprinkled with some brownish points. All the upper scales yellow, with a broken border backwards. Lips and lower region of the temple white. Two square black spots below the eye; and two others of the same form and colour, but rather smaller, in front of the ear. All the lower parts of the body are of a whitish tinge. The sub-collar scales, in two marginal rows, have their posterior border of a brown colour.

Locality.—The southern point of the African continent.

MM. Duméril and Bibron, from whom the character and description are taken, observe that many naturalists (Cuvier among them) have thought that this was the species which Linnæus intended to make known under the name of *Lacerta Seps*; but MM. Duméril and Bibron are not of that opinion. They think that the *Lacerta Seps* of Linnæus ought to be referred to the *Scincus sepiformis* of Schneider (*Gerrhosaurus sepiformis*, Dum. and Bibr.).

This species is figured in the article CHALCIDES under the name of *Chalcis tetradactyla*. The head is there given of sufficient size; but as the extremities can hardly be defined, we add another figure with them on a larger scale.



Saurophis tetradactylus.

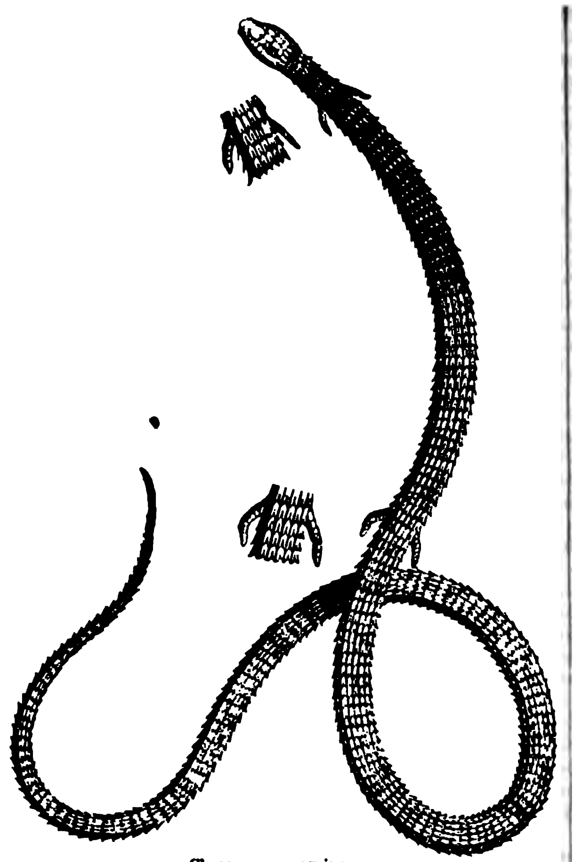
We shall here notice another Saurian form of the same group and section—*Chamæsaura.*

Generic Character.—Tongue of an arrow-head shape, free on its anterior third, very slightly notched in front, with filiform, short, soft, thick papillæ. No palatal teeth. Intermaxillary teeth conical, simple. Maxillary teeth subcylindrical, obtusely pointed. Nostrils lateral, each pierced in a large naso-rostral plate. Eyelids. A small external auricular hole. The last supercranial plates blending with the scales of the nape. Temples covered with scales like those of all the other parts of the body, or rhomboïdal, carinated, and imbricated. Four very short styled feet, terminated by a single unguiculated toe. No lateral furrows. Ovoviviparous.

Example, *Chamæsaura anguina,* Wiegm. (*Lacerta anguina,* Linn.).

Description.—The form may be seen in the cut. The upper part of the head, back, upper part of the neck, and upper part of the tail are brown; but those parts have their median line traversed by a narrow band of a yellow tint; a tint which, becoming a little brighter, is spread over the sides and lower regions of the body. (Dum. and Bibr., from specimens in spirit.)

Locality.—South Africa, Cape of Good Hope.

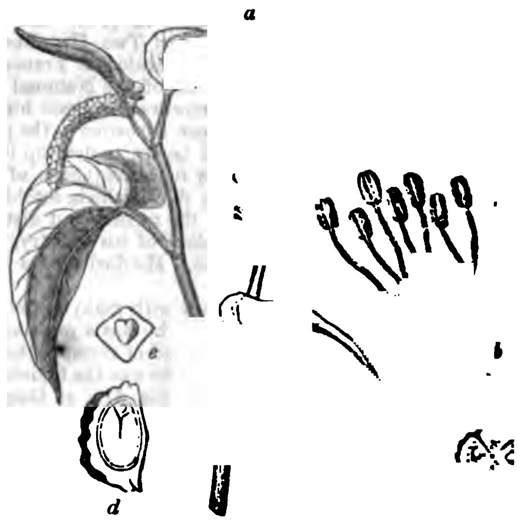


Chamæsaura anguina.

It is interesting to trace in the Saurians the gradual deterioration and abolition of the extremities till the form becomes completely serpentine. In *Heterodactylus* there are still five fingers; but the first finger of the anterior feet is so very short as to be rudimentary. In *Chalcis* (*Cophias*, Fitzinger) there are five toes before, but only three, reduced to tubercles, behind. In *Saurophis* the toes on each of the feet are reduced to four. In *Chamæsaura* there is but one on each foot. In CHIROTES the anterior extremities are short indeed, but five-toed; the posterior extremities are altogether absent. In BIPES the hind feet are each terminated by two unequal processes or toes. In *Pygopus* [BIPES] the anterior extremities are also lost, and the posterior extremities appear in the form of a foot in which no toe is to be seen externally; and in the SCHELTOPUSIKS all trace of external extremities is lost, though the rudiments of posterior extremities may be seen attached to the pelvis. [CHALCIDES.]

SAUROTHE'RA. [INDICATORINÆ, vol. xii., p. 459.]

SAURURA'CEÆ, a natural order of plants belonging to the Achlamydose group of incomplete Exogens. It consists of only a few genera, which are aquatic or marshy herbs or herbaceous plants, with perennial root-stocks, knotted stems, and simple, entire, alternate leaves, with vaginal stipules. The flowers are naked, and seated upon a scale. The stamens are six in number, hypogynous; filament slender; anthers continuous with the filament, having two lobes bursting longitudinally. The ovaries are four, containing one or more ovules; style short: stigma simple. The seeds are few, with an abundant albumen, in the midst of which lies a small embryo, which is enclosed in a persistent vitellus. These plants are very near Piperaceæ, from which they mostly differ in the compound nature of their ovary. This order connects Dicotyledons with Monocotyledons. Its foliage, stipules, and seeds connect it with the former; but the floating habit of some of the species, and their general character, ally them with some of the families of the latter class. They are natives of North America, China, the north of India, and the Cape of Good Hope, where they are found growing in marshes and pools of water. Their properties are not well known, but they seem to be the representatives of the peppers in colder climates; and on account of their less exposure to light, their secretions are not so strong and their properties not so
allies in the tropics.



Saururus cernuus.

a, branch, with leaves and spikes of flowers; b, a naked flower
bract; c, transverse section of fruit; d, section of fruit showing the
large albumen and the embryo in its permanent size; e, the seed.

SAUSSURE, HORACE-BENEDICT DE,
at Geneva, Feb. 17, 1740. His father Nic
sure was also a native of Geneva, and is k
author of some essays, chiefly on agricultur
Young De Saussure was educated with great ca
the college of Geneva, and partly under th
tendence of his father and his maternal uncle
Bonnet. At the age of twenty-two he was appoint
fessor of philosophy in the college, in which
performed the duties of a public teacher for
years, interrupted only by his travels in search of
and especially geological knowledge. The events of
are consequently few, and the substance of
best given in his own words:—

'I had a decided passion for mountains
At the age of eighteen I had already been
over the mountains nearest to Geneva; but
comparatively little elevation, and by no means
my curiosity. I felt an intense desire to view more
the High Alps, which, as seen from the summits of
lower mountains, appear so majestic. At length,
alone and on foot, I visited the glacier of Chamouni,
little frequented, and the ascent of which was regarde
only as difficult but dangerous. I went there ag
following year; and from that time I have not allo
single year to elapse without making considerable
sions, and even long journeys, for the purpose of
mountains. In the course of that period I have
the entire chain of the Alps fourteen times
different routes. I have made sixteen other excurs
the central parts of the mountain mass. I have
the Jura, the Vosges, the mountains of Switzer
part of Germany, those of England, of Italy,
and the adjacent islands. I have visited the ant
canoes of Auvergne, a part of the Vivarais, severa
mountains of Forez, of Dauphiné, and of Burgundy.
these journeys I have made with the mineralogist's h
in my hand, with no other aim than the study
phenomena, clambering up to every accessible
promised anything of interest, and always ret
specimens of the minerals and mountains, esp
as afforded confirmations or contradictions of any
order that I might examine and study them at my le
I also imposed upon myself the severe task of alwa
ing notes upon the spot, and, whenever it was prac
of writing out my observations in full within the tw
four hours.'

This sketch of Saussure's travels and labours ex
from 1758 till 1779. In addition it deserves to be p
larly mentioned, that in 1787 he ascended to the
Mont Blanc, and remained there three hours and a

making observations; in 1788, accompanied by his eldest son, he encamped for seventeen days on the summit of the Col du Géant, at an elevation of 11,170 feet, for the purpose of studying meteorological phenomena; and in 1789 he reached the summit of Mont Rosa in the Pennine Alps, which was the last ascent of importance which he performed.

Saussure resigned his professorship in 1786. He was afterwards a member of the Council of Two Hundred of Geneva; and when that republic was united to France in 1798, he was for some time a member of the National Assembly. The French Revolution however deprived him of almost all his property, which had been deposited in the public funds. An organic disease had begun to develop itself when he was about fifty (probably in consequence of his exertions and privations among the Alps), which, combined with the loss of his property, and the anxiety and distress which he suffered from the convulsions of his country, carried him off at the age of fifty-nine. He died on the 23rd of January, 1799.

Saussure kept up a correspondence with many of the distinguished literary men of his time: he was a member of the Académie des Sciences of Paris, and of several other of the scientific societies of Europe; and he was the founder of the Society for the Advancement of the Arts at Geneva, which is still in a flourishing state.

The labours of Saussure in geology are of a character to secure for his name a just and enduring reputation. Physical geology, the research after the causes of geological phenomena, found in him a diligent and discriminating observer unbiassed by the many speculations of his day, but looking forward, through the results of diligent inquiry into facts, to an improved condition of theory. Less speculative than De Luc, more philosophical than Werner, more original than either, he has had few disciples; but modern geologists have largely imbibed the adventurous spirit which carried him round all the precipices and through all the defiles of the Alps, and may yet copy with advantage the calm and correct induction which he applied to the complicated disorder of the strata in these mountains.

Besides geology and mineralogy, the sciences to which he had especially devoted himself, Saussure had directed his attention to botany, chemistry, electricity, and meteorology. He was also the inventor of several ingenious and useful philosophical instruments—a thermometer for measuring the temperature of water at all depths; an hygrometer to indicate the quantity of aqueous vapour; an electrometer to ascertain the electrical state of the atmosphere; and others.

Saussure's first publication was a 'Dissertatio Physica de Igne,' Geneva, 1759: his next was 'Observations sur l'Ecorce des Feuilles et des Pétales,' Geneva, 1762, which was a kind of supplement to his uncle Bonnet's work, 'Sur l'Usage des Feuilles:' and he wrote some excellent 'Essais sur l'Hygrométrie,' 1763, 4to., in which he made known the important discovery that the air expands and becomes specifically lighter in proportion to the increase of the quantity of moisture in it. But his great work is his 'Voyages dans les Alpes,' of which the first volume was published in 1779, the second in 1786, and the two last in 1796. The title of this work conveys a very imperfect notion of its contents, which indeed embrace the whole of those geological travels which have been before alluded to. His other works consist chiefly of dissertations on physical subjects, in the 'Journal de Physique,' the 'Journal de Genève,' and other scientific publications.

SAUSSURITE, *Axe-stone, Jade*, occurs massive. Cleaves parallel to the faces of a rhombic prism. Fracture splintery. Hardness 5·5. Extremely tough. Colour greenish and greyish white. Streak white. Lustre pearly, inclining to vitreous on the faces of cleavage. Nearly opaque, but translucent on the edges. Specific gravity 3·2 to 3·4.

Before the blow-pipe fuses with difficulty into a white glass.

It was discovered on the edge of the lake of Geneva by Saussure, in rounded masses. It has also been found in Styria, Corsica, and at Madras.

Analysis by Saussure:—

Silica	44·
Alumina	30·
Soda	6·
Lime	4·
Oxide of iron	12·5
	96·5

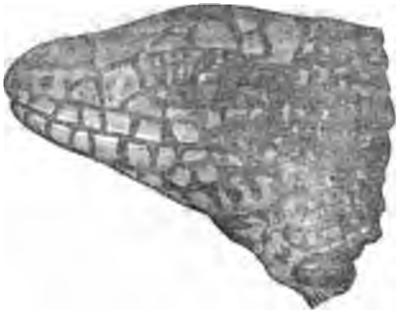
SAUVAGES, FRANÇOIS-BOISSIER DE, was born at Alais in Lower Languedoc, in 1706. In 1722, having received a moderately good education, he commenced the study of medicine at Montpellier, and he took his doctor's degree in 1726. In 1730 he went to Paris, and soon after seems first to have entertained the idea of forming a classification of diseases like those usually adopted for the objects of natural history. He published a sketch of his system in a small volume in 1731, and by this, and some papers which he wrote at the same time, gained so much reputation, that in 1734 he was appointed a professor at Montpellier. The doctrines which he taught there were chiefly those of Stahl, and he contributed greatly towards the removal of the mechanical theories of medicine that had before been prevalent. In 1740 he was elected professor of botany, and subsequently pursued that science with as much energy as that of medicine. In 1763 he published his most important work, the 'Medical Nosology,' in accumulating materials for which he had steadily laboured for upwards of thirty years. He died in 1767.

Of all the works of Sauvages, and they were very numerous, the 'Nosology' is the only one now often referred to. The system adopted in it has indeed shared the fate of all other nosologies [NOSOLOGY], but it still presents a good and complete account of all that was known of practical medicine at the time of its publication. His other writings were short monographs and essays, which were chiefly printed in the scientific Transactions of the day: the best among them are those on hydrophobia, the remedial value of electricity in paralysis, and the 'Methodus Foliorum,' an essay towards the means of determining plants by the characters of their leaves.

SAUVAGE'SIEÆ, a natural order of plants formed by Bartling, and consisting only of the genus Sauvagesia, of which there are six or seven species. Another genus, Luxemburgia, was referred to this order by Bartling, but this has been placed by De Candolle in Frankeniaceæ. Lindley, in his 'Natural System,' makes Sauvagesiæ a suborder of Violaceæ, from which, he observes, it is principally distinguished 'by the stamens being opposite the petals, by the anthers not having a membranous termination, by the presence of five hypogynous scales, and by their fruit having a septicidal dehiscence, so that the seeds adhere to the edges and not the centre of the valves, and by the strongly ribbed and imbricated calyx.' This last character gives them a relation to Hypericaceæ, but from this order they differ in their parietal placentæ and the presence of stipules. They are natives of the tropical parts of South America, growing in moist meadows and the vicinity of streams. The genus Sauvagesia, named after the celebrated physician Sauvages, is characterised by possessing three rows of petals; the outer petals five, ovate or oblong, spreading, deciduous; the intermediate ones filiform, variable in number; the interior five opposite the outer, erect, converging into a tube much smaller; calyx deeply 5-parted, and a capsule enclosed in the permanent floral organs, more or less deeply 3-valved and many-seeded. One of the species, *S. erecta*, upright Sauvagesia, is held in great repute as a medicine in South America. It is very mucilaginous, and has a bitter taste. It is used in Brazil in diseases of the eye, and in Peru and the West Indies it is employed in slight inflammatory affections of the mucous membranes of the bladder and intestines.

SAUVEGARDE, the name by which the monitory lizards or *Safeguards* of the New World are known; *Salvator* of MM. Duméril and Bibron, *Podinema* and *Ctenodon* of Wagler, *Podinema* of the Prince of Canino, *Tejus* of Mr. J. E. Gray.

Generic Character.—Tongue with a sheathing base, very long, very extensible, divided at its extremity into two slender smooth filaments, with rhomboidal papillæ. Palate edentulous. Intermaxillary teeth slightly flattened from before backwards, with two or three notches at their summit. First maxillary teeth *en crocs*. The succeeding ones straight, compressed, tricuspidate in youth, tuberculous in old subjects. Nostrils opening on the sides of the extremity of the muzzle, between a naso-rostral, a naso-frenal, and the first upper labial plates. Eyelids. The tympanic membrane extended on a level with the aperture of the ear. Skin of the lower region of the neck forming two or three transverse simple folds. Back covered with small angular, smooth, non-imbricate scales, disposed in transverse bands. Ventral plates flat, smooth, quadrilateral, oblong, and quin cuncial. Femoral pores. Each foot terminated by five toes, slightly compressed, and not carinated below; two of the posterior toes having a small dentilation on their internal border. Tail cyclotetragonal, a little compressed backwards. (Dum. and Bibr.)



Head of Sauvegarde.

MM. Duméril and Bibron give the following synoptical table of the *Safeguards*:—

Naso-frenal plate followed by	Two plates.	1. Salvator Merianæ.
	A single plate.	2. Salvator nigropunctatus.

Geographical Distribution, Habits, &c.—The warm countries of America are the native places of these Lizards, which arrive at a considerable size, often measuring as much as four or five feet in length. MM. Duméril and Bibron state that they ordinarily inhabit the fields and the borders of woods, although they never climb trees; but they also appear to frequent sandy, and, consequently, arid tracts, where they are said to excavate burrows, in which they lay themselves up for the winter. When, in their flight to avoid pursuit, they come upon a lake, pond, or river, they plunge in, according to D'Azara, to escape from the danger which menaces them, and do not leave the water till all fear of danger is past. These Lizards, observe MM. Duméril and Bibron, have not, indeed, webbed feet; but their long and slightly compressed tail becomes, without doubt, under such circumstances, a sort of oar, of which they well avail themselves. D'Azara states that they feed on fruits and insects, and that they also eat serpents, toads, young chicks, and eggs. He also relates that they are fond of honey; and that in order to procure it without fear of the bees, they come forward at intervals, and, as they run away each time, give the hive a blow with their tail, till by repeated attacks they weary out the industrious insects, and drive them from their home. MM. Duméril and Bibron remark that they have been unable to assure themselves that the *Safeguards* are frugivorous; but they are certain that they feed on insects, because they found remains of them in the stomachs of all the individuals which they opened. Once only among the fragments of *Coleoptera* and the remains of caterpillars they found portions of skin and bones which had certainly belonged to a common *Ameiva*.

MM. Duméril and Bibron think that to *Salvator* should be referred Kaup's genus *Exypneustes*, which, vague as are its characters, seems to them to have for its type one of the two species noted above in the synoptical table. These two *Safeguards*, they observe, though very easily distinguished when the true characters proper to each are well apprehended, bear, nevertheless, so great a resemblance to each other, especially in colour, that it is by no means surprising that they have been confounded together; for, in fact, it was not till after the publication of the work of Spix on the animals of Brazil that these species were mentioned as different.

Example, *Salvator Merianæ*, Dum. and Bibr.

Description.—Intermaxillary teeth ten in number: from thirteen to fifteen maxillary teeth on each side of the upper jaw, the four or five first of which are simple, and augment gradually in length: but the three or four following ones, though equally simple, are shorter, and all the others have a tricuspidate or tuberculous summit, according to the age of the individual. Each of the sides of the lower jaw is armed with from fifteen to eighteen teeth, like those above.

The rostral plate, although having five sides, appears triangular, and it is the same with the two naso-rostral plates, which touch each other by a very small border. The inter-naso-rostral plate is large: it has six faces (pans) of which two only, the greatest, are enclosed in the two naso-rostral plates. The fronto-nasal plates are very much developed, pentagonal, oblong, and nearly as wide before as behind. The frontal plate, equally well dilated, is hexagonal, and generally narrowed at its posterior extremity. The fronto-parietal plates are oblong, hexagonal, and less wide before than behind. The parietal plates are cyclo-polygonal, and bound on each side the interparietal plate, the form of which is very variable. The two first superocular plates are always a little larger than the two last. The naso-frenal plate has nearly a trapezoïdal figure; its anterior border advances into the aperture of the nostril; it is immediately followed by a plate higher than it is long, ordinarily with four faces, after which comes a second, still more developed, having, notwithstanding its six faces, a quadrilateral appearance. This great plate is only separated from the orbit by a row of small scutellæ bordering the anterior edge of the eye. There are eight or nine superior labial plates: the first is oblong-pentagonal; the second trapezoïdal; the third tetragono-equilateral, the same as the succeeding ones, with the exception of the last, whose posterior border is lower than the anterior one. The chin-plate is simple, triangular in appearance, although it really has four sides. There are eight or nine lower labial-plates, all more or less regularly squared. Behind the chin-plate is sometimes found one, sometimes there are found two, which are followed to the right and left by from seven to nine plates, occupying the lower surface of each submaxillary branch. Each of these rows of submaxillary plates is separated from the series of superior labial plates by another suite of plates not less developed than those. The temple is furnished with small smooth plates in juxtaposition: its upper border has five or six, a little larger than the others. When laid along the neck, the fore feet reach the anterior border of the eye. The posterior feet, placed along the sides, do not extend beyond the origin of the arm. The tail sometimes forms by itself two-thirds of the total length of the animal. The upper part of the neck and the back are furnished with small, non-imbricate, smooth, rather convex, square scales, with more or less rounded angles, disposed in transverse bands. They are oval, it seems, in young subjects. The throat and lower part of the neck have hexagonal, smooth, close-set scales; the sides, and sides of the neck, are furnished with smaller scales, but of the same form as those of the cervical and dorsal regions. On the breast are three or four transverse rows of hexagonal scales, like those on the lower surface of the neck, whose folds present very small oval or circular scales, surrounded with very fine granules. Then come, to cover the rest of the breast and all the abdominal region, from twenty-eight to thirty other transverse rows of small quadrilateral oblong plates with a smooth surface, and in juxtaposition. Each of these series is composed of from twenty to thirty-five scutellæ on the preanal region, where they constitute from five to eight transversal rows: these preanal scutellæ are more or less regularly hexagonal, and with age they become rather thick, and put on a porous aspect. The anterior side of the upper part of the arm is covered with smooth, lozenge-shaped, non-imbricate scales; and the same side of the fore arm presents some which are equally smooth and close-set, but of a square form. The upper side of the toes is covered with a row of quadrilateral imbricated scutellæ, with rounded angles, and very much dilated across. The under side of the anterior foot is entirely clothed with very small, oval, smooth scales, rather distant, and surrounded with granules; these scales extend even upon the palms, where they become more dilated than under the arms. Upon each finger is a row of quadrilateral, imbricate, very wide scutellæ, with rounded angles: and on each side are one or two series of scales of a tubercular aspect. The front of the thigh is protected by rather large tetragonal or hexagonal, smooth, very slightly imbricated scales. The calves of the legs have, by way of scales, great lozenge-shaped distinctly imbricate lamellæ. The upper and posterior surfaces of the hind feet are covered with very small rhomboido-convex scales surrounded by granules. The toes, which are slightly compressed, have their external side defended by a series of great scutellæ like those on the upper part of the anterior toes, and their internal border is invested with four or five rows of small, thick, convex plates, more or less regularly quadrilateral. Below, but rather towards the outside, as on the lower surface of the fingers of the hands, is a band of tetragonal scutellæ imbricated and very much extended transversely. The soles of the feet have the same scaly covering as the palms of the hands. Under each thigh are from fifteen to twenty pores; they are very small and pierced on the re-entering border of a notch made in one scale for the reception of another smaller one. The caudal squamules are so disposed that they form a succession of entire verticillations, each alternating with a demi-verticillation placed on the upper part of the tail. All these scales are quadrilateral, much longer than they are wide, and strongly ridged; those of the upper surface are at least double the size of those below and at the sides.

The colour is very variable above: the ground-colour is always black, sometimes very deep; on this is spread a beautiful yellow in the form of spots, sometimes very small and irregularly disseminated, sometimes, on the contrary, rather large and disposed in transverse bands, and very frequently in two rays, which extend one to the right and the other to the left, from the angle of the occiput to the root of the tail, and are continued along the upper part of the side of the neck and the lateral part of the trunk. The upper part of the head and limbs are more or less sprinkled with small yellow drops, which are also seen on the tail: this last is ringed with yellow and black for the two posterior thirds of its extent. All the lower parts are yellow, marked across with black bands more or less narrow, sometimes well defined, and sometimes interrupted and feebly indicated. Some young individuals have been seen with wide and well-defined black bands on a ground of uniform brown applied transversely throughout the length of the neck and the back. The length, according to travellers, is sometimes four and even five feet; but MM. Duméril and Bibron never saw an individual of such dimensions.

Locality.—Nearly the whole of South America and the Antilles. (Dum. and Bibr.)

This is the *Lacerta Teguixin* of Linnæus; *Seps marmoratus* of Laurenti; *Lacerta Monitor* of Latreille; *Tupinambis Monitor* of Daudin; *Monitor Merianæ* of De Blainville, Van Hasselt and Kuhl, &c.; *Tejus Monitor*, Merr., &c.; *Monitor Teguixin*, Fitzing.; *Podinema Teguixin*, Wagl., Wiegm.; *Teguixin Monitor*, Gray; *Monitor Teguixin*, Eichw.; *Tejus Teguixin*, Schinz; *Le grand Sauvegarde d'Amérique*, Cuv.; *Variegated Lizard*, Shaw; *Great American Safeguard*, Griffith's Cuvier.

Salvator Merianæ.

SAUVEUR, JOSEPH, a French mathematician, distinguished by the improvements which he made in the branch of science called acoustics, was born March 24, 1653, at La Flèche, where his father followed the occupation of a notary. Till he was seven years old he was quite dumb, and his organ of voice was never completely developed. He appears to have been born however with a taste for the mechanical arts, and even in childhood he is said to have constructed siphons, fountains, and models of mills. He was sent to a school of the Jesuits, but his taste for calculations caused his mind to be so much diverted from rhetoric and theology, that he made little progress in these studies; and happening to obtain a superficial treatise on arithmetic, he made himself master, without any assistance, of its contents. In 1670 Sauveur travelled on foot to Paris; and one of his uncles having promised to make him a small allowance for his support on condition that he would qualify himself for the ecclesiastical profession, he resumed for a time his theological studies, but a copy of Euclid's Elements which fell in his way, and the lectures of Rohault, soon determined him to abandon this pursuit. Being thrown upon his own resources, for his uncle immediately withdrew the promised allowance, he sought to obtain a subsistence by teaching the mathematics, and in this he appears to have succeeded. At twenty-three years of age, he had the good fortune to attract the notice of Prince Eugene, who received from him some instruction in the sciences; and a foreigner of distinction wishing to be taught the geometry of Descartes, Sauveur, who then had no knowledge of the works of that philosopher, applied himself to the subject with such vigour, that in eight days he was able to give the required instruction. From 1678 to 1680 he was occupied with the study of problems relating to the application of the theory of probabilities to games of chance, and in the latter year he was made mathematical master to the pages of the Dauphiness. In 1681 he was appointed, with Mariotte, to go to Chantilly in order to make some hydraulic experiments at that place; and it was there probably that he was introduced to the Prince of Condé, with whom he subsequently had the honour of corresponding. The conversation of the prince appears to have inspired Sauveur with a desire to make himself master of the art of fortification; and in order that he might join practice to theory, he went in 1691 to the siege of Mons, where he attended daily in the trenches. At the termination of the siege, he visited the fortified places in Flanders, and at the same time he applied himself to the study of military tactics in all its details. At the recommendation of Vauban, he was appointed examiner of the engineers, and was allowed a pension, which he enjoyed till his death.

After his return to Paris, he was appointed, in 1686, to the chair of mathematics in the Royal College; and in ten years afterwards he was made a member of the Académie des Sciences. During the remainder of his life he was employed constantly in improving the mathematical theory of sound; and we learn, not without surprise, that the man who discovered by theory and experiment the velocity of the vibrations of musical strings under various circumstances of magnitude and tension, had neither ear nor voice; in fact it appears that he was obliged to avail himself of the aid of practical musicians in order to appreciate the musical intervals and concords.

This mathematician may be said to have almost invented the science which has since been so much extended by Dr. Brook Taylor, by Daniel Bernoulli, D'Alembert, Euler, and Chladni. Theoretical music had been the subject of part of his lectures at the Royal College in 1697; but the first published details respecting his researches in acoustics are contained in the volume of the Académie for the year 1700. The different papers which he wrote afterwards are in the volumes for 1702, 1707, 1711, and 1713.

Sauveur was twice married, and he died July 9, 1716, at the age of 63 years, with the reputation of having been a man of kind disposition and great uniformity of temper. It appears that the few persons who, in France, cultivated the sciences in that age were nearly excluded from general society; for J. J. Rousseau, in his 'Confessions,' compares those persons to the asymptotes of certain curves; observing that they endeavoured perpetually to approach, without being able to come in contact with, the rest of the world. The observation does not however apply to the subject of this article, who, probably from the sociability of his manners, seems to have been surrounded by a numerous and agreeable circle of friends.

SA'VACOU. [BOAT-BILL.]

SAVAGE, RICHARD, was born January 10, 1697-8. His mother, the countess of Macclesfield, had during her pregnancy made a public avowal of her infidelity to her husband, who, in consequence, obtained an act of parliament by which their marriage was annulled, and the offspring rendered illegitimate. Lord Rivers, who was declared by Lady Macclesfield to be the father of her son, so far recognised him as to become his godfather, and to allow him to be called by his name; but he afterwards abandoned him to the care of his mother. The countess disowned her unhappy child, leaving him to pass his infancy and boyhood under the precarious protection of strangers; and had it not been for the charitable intervention of her mother, Lady Mason, the destiny of Savage would probably have been as obscure as the most unnatural parent could have wished. By the kindness of this lady he was sent to a small grammar-school near St. Alban's, and afterwards placed by his mother with a shoemaker in London. Soon after this, by the accidental discovery of some papers, he became acquainted with the circumstances of his birth, which had been studiously concealed from him; and he made many efforts to obtain an interview with his mother, who however resolutely refused to see him. While very young, Savage commenced his career as an author by taking part in the Bangorian controversy, on which he wrote an unsuccessful poem, afterwards suppressed by himself. At the age of eighteen he published a comedy called 'Woman's a Riddle;' and two years afterwards another, 'Love in a Veil,' both borrowed from the Spanish. Though these were failures, he thereby obtained the notice of Sir Richard Steele and Mr. Wilks, an actor. He became better known as an author by his tragedy of 'Sir Thomas Overbury,' in which he himself acted the part of Sir Thomas Overbury; and the profits of this play, and of a subscription raised for him at the time, produced a sum which appeared considerable to one so necessitous. In the year 1727 his irregular habits of life led him into one of the tavern broils then very common, in which he unfortunately killed a man, and was tried and condemned to death. The circumstances of the affair, and the doubtful character of the witnesses who appeared against him, becoming generally known after his sentence, intercession was made for him with the queen of George II. by the countess of Hertford, and the royal pardon was granted to him, in spite of the efforts of his mother, who on this occasion spread a report that he had once attempted her own life.

The notoriety of this event was succeeded by an extraordinary reaction of public opinion in his favour: he was courted by all ranks, the fashions of the day were ruled by his opinions, and he was enabled to maintain an appearance in society above his station by means of an annuity of 200*l.* a year obtained from his mother's relations, under the threat that he would expose her cruelty by lampoons, if she refused to support him. At this time he published his longest poem, the 'Wanderer,' which was much admired at the time.

Prosperity made more apparent that fickleness of character which led him into extravagance and alienated his friends from him. His fair prospects were soon for ever clouded by a quarrel with his patron Lord Tyrconnel, who accused him of ingratitude, and banished him from his house. His acquaintance in consequence generally deserted him, and he sank into obscure poverty as suddenly as he had emerged from it. The remainder of his life was passed in discreditable efforts to regain his position in society by alternately flattering and satirising all from whom he had anything to hope or fear. In despair of ever conciliating his mother, he published 'The Bastard,' the severity of which drew down upon her much public indignation, though it does not seem to have reawakened sympathy in favour of the author. After an unsuccessful attempt to obtain the situation of poet-laureat, Savage received from the queen a pension of 50*l.* a year as a reward for a poem in honour of her birthday, which his gratitude renewed annually from this time till her death, when the royal bounty was withdrawn from him. Having made no provision for such a contingency, he was obliged, from his necessities, to leave London in the year 1739, retiring first to Bristol and then to Swansea, where he lived for about a year, receiving an allowance raised by subscription among his friends. In January, 1742-3, on his return to Bristol, he was arrested for a debt of 8*l.*, and sent to prison in that city, where he died, July 31, 1743.

The name of Savage has become better known than his merits deserve, from the singularity of his early misfortunes, and still more from the elaborate life of him which Johnson, the companion of his distresses, has inserted in his 'Lives of the Poets.' This memoir is interesting not only as a most faithful picture of the adventurous career of Savage and of the manners of his age, but because it exhibits very strikingly the chief excellencies and defects of the author as a biographer and a critic. In the judgment which he pronounces upon the poems of his friend he is more swayed by prejudice than in his estimation of his moral worth. The writings of Savage are in unison with his character. The carelessness and want of system in his graver compositions, the frivolity in the choice and treatment of lighter subjects, his unchastened style, feeble in its vehemence, illustrate the strength of feeling and passion, the infirmity of purpose, the thoughtless improvidence, and want of settled principles of conduct, which made the actions of Savage as inconsistent as his fortune was chequered.

In his 'Wanderer,' he declaims without the moral dignity of a didactic writer, his versification is harsh, his descriptions tedious, and the whole poem ill arranged and thronged with confused imagery. His panegyrics betray the needy adventurer deficient both in self-respect and in tact. His praise is unskilful, his compliments (as has been well observed by Johnson) are constrained and violent, heaped together without the grace of order or decency of introduction.

He made enemies as readily as friends, and he testified his resentment by satires full of coarse personal invective.

From this general censure of the works of Savage 'The Bastard' is in a great measure to be excepted. Strong natural feelings, goaded by a sense of undeserved wrongs, gave to this poem a concentrated energy of expression, a refinement of sarcasm, and an exalted tone of thought, of which there are only faint traces in his other writings.

Of the person of Savage Johnson has left this description:—'He was of a middle stature, of a thin habit of body, a long visage, coarse features, and melancholy aspect; of a grave and manly deportment, a solemn dignity of mien, but which upon a nearer acquaintance softened into an engaging easiness of manners. His walk was slow, and his voice tremulous and mournful. He was easily excited to smile, but very seldom provoked to laughter.'

SAVANNA. [PLAINS.]

SAVANNAH, Town and River. [GEORGIA.]

SAVARY, NICOLAS, was born in 1750, at Vitré in Bretagne, France. Having completed his studies at the college of Rennes, he went to Paris, where he resided for some time. He had early conceived a desire of travelling, and in 1776 he landed in Egypt, where he remained till 1779. He was some time at Alexandria and Rosetta, but fixed his residence chiefly at Cairo, making occasional excursions in the neighbourhood, and to Damietta and other places in Lower Egypt. He re-embarked at Alexandria in September, 1779, and travelled during two years or thereabouts among the islands of the Grecian Archipelago. It is probable that he returned to France about the middle of 1781.

The first work which Savary published after his return was a translation of the Korán, the greater part of which had been made in Egypt, 'Le Coran, traduit de l'Arabe, accompagné de Notes, et précédé d'un Abrégé de la Vie de Mahomet,' Paris, 1783, 2 vols. 8vo. This is the best translation of the Korán which the French possess. The materials for the Life of Mohammed have been drawn chiefly from Abu'l Feda and the 'Sunnah,' a collection of traditions considered authentic by the Arabians. Savary next published a series of extracts from 'Le Coran,' under the title of 'Morale de Mahomet, ou Recueil des plus pures Maximes du Coran,' Paris, 1784, 12mo. and 18mo.

In 1784 Savary published the first volume of his 'Lettres sur l'Egypte.' The other two volumes were published in 1785, together with a new edition of the first volume, Paris, 3 vols. 8vo. This work had at first an extraordinary reputation. The interest connected with the country itself, especially the monuments of Antient Egypt, the picturesque style, and the brilliant colouring of the descriptions, rendered the work extremely popular. It was translated into German (Berlin, 1786, 8vo.) and English (London, 1786-7, 2 vols. 8vo.). Many objections however were afterwards made to the work, as that it contained few new facts, the description of the pyramids having been taken from Maillet, the account of Upper Egypt from the Père Sicard, and other parts from Joinville, &c.

Savary was afterwards severely commented upon by Michaelis, in his 'Journal of Arabic Literature,' who affirmed that in making use of Abu'l Feda he has always had recourse to Michaelis's Latin translation, and has not even understood that correctly, and that he was ignorant even of the pronunciation of the vernacular Arabic. The publication of Volney's 'Travels in Egypt' about the same time, which contains numerous contradictions of Savary, added to the annoyance arising from the criticisms of Michaelis and the decline of his reputation, is said to have affected his health, which was naturally delicate. He died at Paris, February 4, 1788, at the age of 38.

A few months after Savary's death, his 'Lettres sur la Grèce,' a work which he was engaged upon during his illness, was published at Paris, 8vo. It is incomplete, the author having worked up only a part of his materials at the time of his death. A tale translated from the Arabic, 'Les Amours d'Anas Eloujond et de Ouardi,' was published in 1789, 18mo. Savary had composed while in Egypt a 'Grammaire de la Langue Arabe Vulgaire et Littérale,' which he had presented to the French government in 1784, and it was ordered to be printed, but for want of Arabic type it lay in the royal printing-office till it was claimed on behalf of Savary's brother, by whom it was again presented to the government, and it was again ordered to be printed in 1796, but the publication however was not completed till 1813 (Paris, 4to.), and in the mean time the Arabic grammars of D'Herbin and Silvestre de Sacy had already appeared. It is in French and Latin, with many familiar dialogues and Arabic tales and songs, which in some degree compensate for the brevity of the syntax. This grammar however will not bear comparison with that of De Sacy. Savary was also engaged upon an Arabic Dictionary, but none of it has ever been printed.

(*Biographie Universelle.*)

SAVE, River. [AUSTRIA.]

SAVERDUN, a town in France, in the department of Arriège, eight or nine miles north of Pamiers. It was antiently one of the chief towns and strongest fortresses in the county of Foix: it resisted the attack of Simon de Montfort in the crusade against the Albigeois, and was, in the fifteenth century, one of the strongholds of the Huguenots. The fortifications have been destroyed. It is divided into the upper and lower towns, the latter the handsomer and more populous of the two. The inhabitants amounted, in 1831, to 1897 for the town, or 3327 for the whole commune; they trade in cattle and fruit, and have six fairs in the year.

SAVERNE. [RHIN, BAS.]

SAVIGLIANO. [SALUZZO.]

SAVI'GNIUM, Dr. Leach's name for a genus of Sessile Cirrhipeds, with four valves soldered together, and a bivalve convex operculum, the ventral and posterior valve on each side being soldered together. In other points the genus resembles PYRGOMA.

SAVILE, SIR HENRY, an eminent scholar and mathematician, born at Over Bradley, near Halifax, in Yorkshire, November 30, 1549. He was admitted a student of Merton College, Oxford, in 1561, where he proceeded to the degree of B.A., and was chosen fellow of the college. He took the degree of M.A. in 1570, about which time his fondness for the mathematics induced him voluntarily to read public lectures in the University on Euclid, Ptolemy, and other writers. He also served as proctor for two years, and in 1578 he made a tour through the Continent, and at his return had the distinguished honour of being chosen tutor in the Greek language to Queen Elizabeth, who, it is said, had a great esteem for him. He was elected warden of Merton College in 1585, in which office he continued for thirty six years, and greatly benefited that society by his exertions. During this time he enriched the literature of his country with several classical and historical publications. He was made provost of Eton College in 1596, and on the accession of King James he was knighted. He died at Eton College, on the 19th of February, 1622, in the seventy-third year of his age, and was buried in the chapel there. On this occasion the University of Oxford paid the greatest honours to his memory, by having a public speech and verses made in his praise, which were published under the title of 'Ultima Linea Savilii.' He was indeed a munificent benefactor to the University of Oxford, in which, besides various other donations, he founded, in 1619, two professorships, one of geometry, the other of astronomy, which are still maintained. His library, consisting of a very curious and valuable collection of scientific books and manuscripts, he left to the University, and it is now preserved in a separate room near the Bodleian Library, the two Savilian professors being the only persons who have immediate access to it. His fame principally rests on a magnificent edition of all the works of St. Chrysostom, which was published in 1613, in 8 vols. folio, in the production of which he is said to have expended no less than 8000*l.*, and on his collection of our best historians, published in 1596, under the title of 'Rerum Anglicarum Scriptores post Bedam.' As a mathematician, he is known principally by his 'Lectures on the first book of Euclid's Elements,' published in 1621, but several MS. collections of his on the history of the sciences are preserved in his library at Oxford.

SAVILE, GEORGE, MARQUIS OF HALIFAX, was the son of Sir William Savile, a Yorkshire baronet, of antient family, and of Anne, daughter of the lord keeper Coventry. Being hereditarily attached to the Stuarts, ambitious, and endowed with brilliant talents, he played an active and a successful part in the intriguing reigns of Charles II. and James II. In 1668 he was raised to the peerage, by the titles of Lord Savile of Eland and Viscount Halifax; he was created earl in 1679, and marquis in 1682. He died in 1695, and the title became extinct in 1700, by the death of his son. The witty Lord Chesterfield was his grandson by the mother's side.

It is hard to state shortly his political history or principles, except by saying that he was the chief of the body to which the expressive name of Trimmers was given. So far however as he was attached to any principle, it seems to have been to the cause of civil liberty as then understood. He opposed the Non-resisting Test Bill in 1675, as well as, both in those times and after the accession of James, the relaxation of the tests enacted against the papists. He opposed the scheme for excluding the Duke of York from the succession, preferring to limit his authority when the crown should devolve on him. He declined to take part in bringing over the Prince of Orange; but was president of the convention parliament, and strongly supported the motion for declaring the throne vacant. On the accession of William and Mary he was made privy seal; but he soon retired from the administration, upon inquiry being proposed to be made as to the authors of the prosecutions of Lord Russell, Sidney, &c., in which he, as a member of the then existing government, had concurred; and he continued in opposition thenceforward till his death.

'He was,' says Burnet, 'a man of great and ready wit, full of life, and very pleasant, much turned to satire. . . He was punctual in his payments and just in all private dealings; but with relation to the public, he went backward and forward, and changed sides so often, that in the conclusion no side trusted him; he seemed full of commonwealth notions, yet he went into the worst part of King Charles's reign. The liveliness of his imagination was always too hard for his judgment. His severe jest was preferred by him to all arguments whatever; and he was endless in council, for when after much discourse a point was settled, if he could find a new jest, whereby he could make that which was digested by himself seem ridiculous, he could not hold, but would study to raise the credit of his wit, though it made others call his judgment into question,' &c.

His works are lively and elegant. The chief of them are these: 'Character of a Trimmer,' 'Anatomy of an Equivalent,' 'Letter to a Dissenter,' 'Miscellanies,' and 'Maxims of State.' He left two manuscript copies of his memoirs, both of which were destroyed unpublished, one by the Earl of Nottingham, the other by his granddaughter Lady Burlington. Horace Walpole says that this was done at Pope's suggestion, because the papists were represented in an unfavourable light. The loss is to be regretted, considering the strong satirical talent and position of the author.

SAVIN. [JUNIPERUS.]

SAVINGS' BANKS. [BANKS FOR SAVINGS.]

SAVO'NA, the name of a province and town of the Sardinian States, in the western Riviera of Genoa. The province of Savona is bounded on the north-east by the province of Genoa Proper, and on the south-west by that of Albenga, south-east by the Mediterranean Sea, and north-west by the Apennines, which separate it from the province of Mondovi in Piedmont. The soil partakes of the general character of the Riviera, and produces abundance of fruit, oil, and wine. The climate is somewhat colder in winter than at San Remo and other places farther west, because it is more open to the northern winds. The Apennines near Savona are lower than the rest of the Ligurian Apennines, being only 1500 feet above the sea, and on the other side of them is the valley of the Bormida, which slopes towards the plains of the Po. The population of the province of Savona amounts to 62,000, distributed in thirty-eight communes. The principal towns are: 1, Savona, a walled town of 15,600 inhabitants, and the most considerable in the duchy of Genoa, after the capital. (Bertolotti.) The streets are narrow, though well paved, and the interior aspect of the town is gloomy. It carries on a considerable trade; the harbour, which was once good, was partly filled up by the Genoese in 1525-28, through commercial jealousy; it is still very safe, but only fit for vessels of 200 tons. Savona is the residence of many noble and other substantial proprietors of the surrounding country; it contains some good palaces and several fine churches, among others the new cathedral built in the seventeenth century, the former cathedral, which had been raised by Julius II., when bishop of Savona, having been destroyed to make room for the citadel. The present cathedral is adorned with valuable paintings and sculptures. The sanctuary of La Madonna di Savona, situated five miles northwest of the town, in the Apennines, and on the road which leads to Mondovi in Piedmont, has also some good paintings, besides numerous votive offerings. Savona is the birth-place of Chiabrera, one of the best Italian lyric poets. 2, Albissola, a pretty town on the sea-shore, has 3500 inhabitants, and several handsome villas of the Genoese nobility Julius II. was born at Albissola. 3, Noli, a small town in a picturesque situation near the sea. 4, Cairo, in the Apennines, has 3400 inhabitants. Near Cairo is the village of Millesimo, famous in the history of Bonaparte's first Italian campaign, in 1796. In the neighbouring old castle of Cosseria, 1500 Piedmontese grenadiers withstood for thirty-six hours all the attacks of the French, in which two French generals were killed and Joubert was wounded. At last they were obliged to surrender from want of water.

SAVONAROLA, GIRO'LAMO, a Dominican monk, a native of Ferrara, made himself known by his eloquent preaching at Florence, where he was living in the convent of S. Marco, which belonged to his order, in the latter part of the fifteenth century. In his sermons he used at times to assume the tone of a prophet, foretelling public calamities as a punishment for the sins of the people. Florence was then enjoying peace and prosperity under the administration of Lorenzo de' Medici, all Italy was quiet, and yet Savonarola startled his hearers by foretelling the approaching irruption of fierce foreign hosts, which would bring bloodshed and desolation over the land. A few years after his prophecy was fulfilled by the invasion of Charles VIII. of France and his ruthless bands, and an age of calamities began for Italy. Before this however Savonarola was wont to inculcate democratic doctrines; he recommended a return to the former popular system of government, which had been interrupted by the ascendency of the Medici; and he even declaimed against Lorenzo himself. Lorenzo took little notice of this; and when his friends urged him to check the monk's audacity, he replied, that as long as the preacher exerted himself to reform the morals of the citizens of Florence, he should willingly excuse his incivility to himself. When Lorenzo fell ill, in the spring of 1492, and his life was despaired of, Savonarola appeared by his bed-side, some say at Lorenzo's own request. The conversation that followed is variously related. Poliziano, an eye-witness, states that Savonarola exhorted Lorenzo to be firm in the Catholic faith, to which the sick man assented. The monk then asked Lorenzo whether, in case he recovered, he purposed to live a virtuous and well-regulated life, to which a ready assent was also given. Lastly, Savonarola told Lorenzo that he ought to bear his death with resignation, if such be the will of God. 'With cheerfulness,' replied Lorenzo. Savonarola was then going to quit the room, when Lorenzo called him back, and requested his benediction, which the monk readily gave in the solemn form of the liturgy, Lorenzo pronouncing the usual responses with a firm and collected voice.

Such is the account of Poliziano, written soon after the event, but a different one came into circulation a long time after, and was registered in the biography of Savonarola, written by Gianfrancesco Pico of Mirandola, nephew of the celebrated Giovanni Pico, the friend of Lorenzo. The story is, that Savonarola was sent for to hear Lorenzo's confession, and that among other injunctions to which Lorenzo readily assented, the monk required him to promise that if he should recover, he would restore the republic to its former state of popular freedom, and as Lorenzo made no reply to this, Savonarola left him without giving him absolution. Roscoe thinks this tale to have been an invention of that party spirit which broke out some time after Lorenzo's death, and which led to the expulsion of Piero de' Medici, Lorenzo's son, in 1494. Savonarola acted a conspicuous part in the disturbances which followed. He became the leader of the democratic party, which was styled the Piagnoni or lachrymose party, because, in imitation of their leader, they were continually denouncing and bewailing the sins and corruption of their fellow-citizens. The opposite or aristocratic party, that wished to place the government in a few hands, were styled Compagnacci, and also Arrabbiati, or 'enraged.' The Piagnoni succeeded for a time, and a general legislative council was formed of the citizens, above thirty years of age, and who were 'netti di specchio,' that is to say, inscribed in the public books as having always paid their taxes regularly. A vast hall was constructed for their meetings in the town palace. Savonarola's influence was now very great, being looked upon by his party as a kind of prophet and supreme judge. Grave citizens mixed with friars, and children, assembled in the public places crying 'Viva Cristo,' singing hymns composed for the occasion, and dancing with frantic gestures. But the Arrabbiati were not idle; they represented Savonarola as an impostor, and they accused him of heresy at Rome. Pope Alexander VI. (Borgia) summoned him to appear before him, in default of which he excommunicated him. Savonarola, who had long been preaching against the corruptions of the clergy, did not spare the head of the church, whom he styled a usurper, and he wrote to several princes urging them to assemble a general council, before which he made sure of proving that Alexander not only was not a legitimate pontiff, but was not even a Christian. In the year 1497, Piero de' Medici made an attempt to re-enter Florence by surprise, at the head of an armed party, but the plot was discovered, and several of his abettors within the town being arrested, five of them were condemned to death, and the rest to banishment. They appealed from their sentence to the great council of the citizens, but Savonarola and his party urged the immediate execution of the sentence, and the five were beheaded. This enraged the aristocratic party, who, joined to the secret enemies which Savonarola had among the clergy, encouraged two Franciscan monks to preach against him. Savonarola, thus assailed, called to his aid a brother Dominican, Domenico da Pescia, and both retorted from the pulpit against the Franciscans. The contest was kept up for some time with mutual accusations and vituperations, until Frà Domenico, excited beyond reason, proposed to prove the superiority and sanctity of his master by walking through the flames, and, strange to say, one of the Franciscans undertook to do the same on the part of his brethren. The mode of trial was arranged by the magistrates; a mass of combustibles was laid in the square, and a walk was made across, through which the champions were to pass while the faggots were blazing. On the appointed day, 17th April, 1498, Savonarola and his champion, attended by a numerous procession, made their appearance, giving out the psalm 'Exurgat Deus et dissipentur inimici ejus.' His opponent Frà Giuliano Rondinelli, attended by some Franciscan monks, walked silently and steadily to the place of trial; the flames were kindled, and the crowded spectators stood in mute astonishment and expectation, when Savonarola proposed that his champion Domenico should bear the consecrated host through the fire. This proposal shocked the whole assembly, and the magistrates and heads of the clergy exclaimed against it as a profanation, and as a tempting of God himself. Frà Domenico however refused to proceed without the host, and the trial was given up. This business ruined the credit of Savonarola: on his return to his convent of S. Marco he was taunted by the populace, and soon after a party of his enemies entered the convent by force, and dragged him, with Domenico and another monk, to prison. He was tried before a mixed lay and ecclesiastic commission appointed by Alexander VI. His eloquence at first startled his judges, but the implements of torture being produced, the firmness of Savonarola failed him, and he acknowledged the falsehood of his pretensions to supernatural powers. He was condemned to death, and he and his two associates, being led to the spot prepared for the trial, were first strangled, and their bodies thrown into the flames, on the 23rd of May, 1498.

Savonarola left several works, both in Italian and in Latin, one of which, entitled 'Triumphus Crucis,' is a demonstration of the truths of Christianity. His sermons however, of which some remain, are the most remarkable of his productions. He was eminently a popular orator, and profoundly versed in the art of exciting the feelings. His memory has found several apologists, among the rest Filippo Neri, and Barotti, in his 'Biographies of Authors Natives of Ferrara.'

SAVOY (*Savoia* in Italian, *Savoie* in French), a country with the title of duchy, which belongs to the Sardinian monarchy. It forms part of the highlands of the Alps and is geographically united to South-western Switzerland, being included in the basin of the Rhône. Savoy extends from 45° 4′ to 46° 24′ N. lat., and from 5° 37′ to 7° E. long. The boundaries of Savoy are: on the east, the great chain of the Graian and Pennine Alps, which divide it from Piedmont and the Valais; on the north, the Leman lake; on the west, the Rhône, which divides it from France; and on the south, an offset of the Cottian Alps, which, running westwards from the group of Mont Cenis, divides the valley of Maurienne, the southernmost part of Savoy, from Dauphiné. This offset ends at the valley of the Isère, which forms a natural opening on the south-west, between Savoy and France. North of the Isère a ridge runs in the direction of the Rhône, forming a natural barrier to Savoy on that side. This ridge has been cut through at the place called Les Echelles, to make the high road from Chambéry to Lyon.

Savoy consists of several valleys formed by offsets of the Alps. It is divided into three basins: the northern basin, the waters of which flow northwards into the Leman lake; the central basin, the waters of which flow by means of the Arve, the Fier, and the lake Bourget westward into the Rhône; and the southern basin, which is drained by the Isère and its affluents. The Isère runs southwards into France.

The administrative division of Savoy corresponds to the geographical configuration of its surface and its principal valleys. The country is divided into eight provinces:—1, Chablais, which comprises the southern coast of the Leman ake and the numerous valleys which slope towards it. The Dranse, which rises in the mountains near the borders of he Valais, and enters the lake half-way between the towns of Evian and Thonon, is the principal river of Chablais. 2, Faucigny, south of Chablais, consists chiefly of the long valley of the Arve, from its source in the Col de Balme to a few miles below Bonneville, where the river enters the province of Carouge. The well known valley of Chamouny belongs to Faucigny, and the romantic but comparatively neglected valley of the Giffre, the principal affluent of he Arve, with its fine cascades and the bordering glaciers of Mont Buet, forms also part of Faucigny. 3, Genevois, west of Faucigny, consists of the valley of the river Fier, an affluent of the Rhône, and of the basin of the lake of Annecy, the waters of which have their outlet in the Fier. 4, The province of Carouge lies north of the Genevois, and between it and the borders of the canton of Geneva, to which part of its territory and the town of Carouge itself, from which the province takes its name, were ceded by the treaty of St. Julien in 1815. St. Julien is now the chief town of he province. The small river Les Usses, which enters the Rhône [illegible] Seyssel, is the principal outlet of the waters of [illegible] province of Carouge. 5, Haute Savoie, south of Faucigny, consists of the valley of the Arli, an affluent of the Isère, which flows from north to south. 6, Tarantasia or Tarentaise, south of Haute Savoie, consists of the long valley of the Isère, running from east to west, from its sources at the foot of Mont Iseran to the confluence of the Arl. Tarantasia is, next to Faucigny, the most Alpine part of Savoy, and the most interesting to mountain tourists. 7, Maurienne, south of Tarantasia, consists of the valley of the Arc, which has its source at the foot of Mont Cenis, and oins the Isère above Montmélian. The high road to Italy eads through the whole length of Maurienne. 8, Savoy Proper, the most level and most fertile part of Savoy, lies west of Maurienne and Tarentaise, and south of Genevois. It is divided on the west from France by the Rhône and its affluent the Guier. The waters of Savoy Proper find an outlet partly southwards by the Isère, and partly by the Leisse and other streams which run westward into the lake of Bourget, which lake enters the Rhône by a canal called that of Saviere. The lake of Bourget lies five miles north-west of Chambéry; it is ten miles long and three wide, and the surface is 700 feet above the sea.

The principal towns of Savoy are—1, **Chambery**, the capital of the whole duchy. 2, **Annecy**, the head town of the province of Genevois. 3, Thonon, the head town of Chablais, situated on an eminence which commands a splendid view of the Leman lake. The country around Thonon is very fertile. Thonon has a handsome town-house and some other good buildings, and 4200 inhabitants. A few miles north-east of Thonon are the remains of the convent of Ripaille, built by Amadeus VIII. Being sold by the French at the time of the Revolution, it was stripped of all its ornaments, and it has been since converted into a farm. Some of the towers remain; the church and the library have been transformed into barns. 4, Aix-les-Bains, in Savoy Proper, much frequented for its baths. [Aix.] 5, Rumilly, in the province of Genevois, has 4000 inhabitants. 6, Moutiers, the capital of Tarentaise, is a small town with 2000 inhabitants, and a bishop's see. Moutiers has salt-works for purifying the salt which is derived from the neighbouring springs of Salins, and also a school of mineralogy and metallurgy, with three professors, a cabinet of minerals, a library, and a chemical laboratory. The lead-mines of Pesei and Macot, in the mountains near Moutiers, employ about 600 workmen. The net yearly produce of the mines, which are worked for the government, is valued at between 60,000 and 80,000 francs.

The mine of Pesei is situated at an elevation of 4500 feet above the sea, and that of Macot at the height of 6000 feet. The ore is sent to Conflans, where it is smelted and purified. The mineral springs of La Perriere, situated in the valley of the Doron, about three miles from Moutiers, have been much frequented of late years by invalids from Switzerland and France. They are particularly recommended for cutaneous diseases and rheumatism. The province of Tarentaise has also numerous mines of anthracite, which are worked by the country people, and it is rich in marble of various colours. 7, Bourg St. Maurice in Upper Tarentaise, on the road leading to Italy by the Little St. Bernard, is a town of 3000 inhabitants, and carries on considerable trade in cattle. From the village of Scez above Bourg St. Maurice, the narrow valley of Tignes leads south-east to the sources of the Isère, at the foot of Mont Iseran, a noble pyramid 13,300 feet high, covered with perpetual snow and surrounded by glaciers. From Scez a road leads in an easterly direction to the pass of the Little St. Bernard, 7192 feet above the sea, and from thence into the valley of Aosta. The pass is practicable nearly all the year round, but only for horses and mules. A Roman road constructed by Augustus led formerly from Aosta, or Augusta Prætoria, over the Little St. Bernard, and down the valley of the Isère to Vienne on the Rhône. Traces of this road are still visible in the valley of Aosta, but all vestiges of it have disappeared on the Savoy side. On the summit of the pass is an antient column of cipoline marble, 15 feet high, which is called 'Colonne de Iou,' or of Jove, and near it is a circle of stones probably Druidical, but which the country people call the circle of Hannibal. It is now generally admitted that Hannibal entered Italy by the pass of the Little St. Bernard. Tarentaise is altogether a very interesting region, though little visited by tourists. Albanis Beaumont, in his 'Description des Alpes Grecques et Cottiennès;' Vernheil, in the 'Statistique du Département du Mont Blanc,' Paris, 1807; Roche, in his 'Notizie Istoriche,' printed at Moutiers in 1819; and Bertolotti, in his 'Viaggio in Savoia,' 1828, have illustrated this province. It was the country of the antient Centrones, who, with their neighbours the Salassi, long resisted the Roman arms, and were only subjugated in the time of Augustus. A village on the banks of the Isère, above Moutiers, bears the name of Centrone, and a little higher up, in the village of Aixme, several Roman inscriptions exist, one of which is the following votive one in verse, written by the Proconsul I. Pomponius Victor, in the time of Augustus, and which is interesting for the feeling which it displays:—

'Silvane sacra semicluse fraxino,
Et huius alti summe custos hortuli,
Tibi hasce grates dedicamus musicas,
Quod nos per arva, perque montes Alpicos
Tuique luci suave olentis hospites,
Dum jus guberno, remque fungor Cæsarum,
Tuo favore prosperante sospitas,
Tu me, meosque reduces Romam sistito,
Daque Itala rura te colamus præside.
Ego jam dicabo mille magnas arbores.'

I. Pomponii Victoris, Proc.
Augusti T.

8, The town of St. Jean, the chief place in the province of Maurienne, has 2500 inhabitants, and a very old cathedral, in which lie buried some of the earlier counts of the house of Savoy. The other towns of Maurienne, Modane, St. Michel, Lanslebourg, and Aiguebelle, do not reckon 2000 inhabitants each. Maurienne has mines of iron, copper, and lead, the aggregate produce of which amounts to 600,000 francs yearly.

The late king Charles Felix began the embankment of the three principal rivers of Savoy, the Arve, the Isère, and the Arc, by which means large tracts of fertile land have been reclaimed.

The population of the duchy of Savoy is 501,000, 129,000 of whom inhabit the province of Savoy Proper. A great part of the country is rocky and barren, and the male inhabitants are obliged to leave their homes in order to get a subsistence. Cattle and sheep constitute the chief wealth of the Alpine districts. Savoy does not produce corn enough for its consumption. Wine is made in most parts, and some of it is very good. Silkworms are reared in Savoy Proper, and fruit-trees are abundant. The people of Savoy have an old established reputation for honesty, loyalty, and bravery. Savoy has produced many distinguished men of learning, among others, St. Réal, Vaugelas, Gerdil, Berthollet, Ducis, Brogny, Berger, &c.

The popular language of Savoy is a Romance dialect, like those of Western Switzerland, but the people of the towns speak good French.

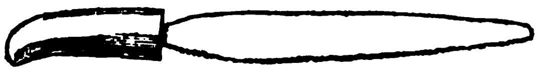
The statistics of the administration, education, &c. of Savoy are given under SARDINIAN STATES.

SAVOY, HOUSE OF. [SARDINIAN STATES.]

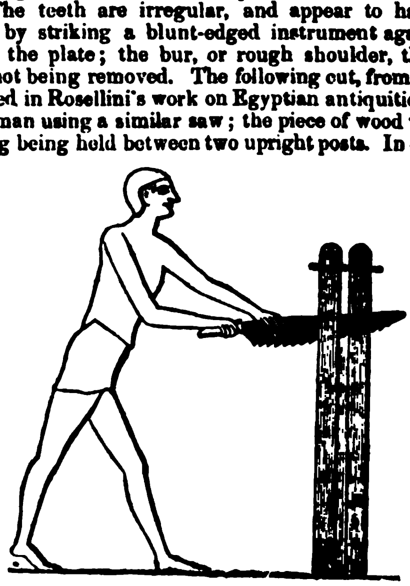
SAW, an instrument for cutting timber or other hard substances, usually formed of a plate of steel with a notched or serrated edge. The action of a saw is different from that of a knife or sharp-edged tool; the latter being used simply to separate the fibres, while the former is made, by a rapid motion in the direction of its length, to cut or tear away a portion of wood equal to the thickness of the blade.

The division of wood by riving or splitting was probably the most antient method of reducing it to pieces of convenient size and shape; and, owing to the facility with which it is done, and the superior strength of the planks so produced, this process is still occasionally resorted to. If the grain of timber were straight, this plan would have the advantage of economy, but as it is not so in general, considerable waste is occasioned by it when the pieces are required to be straight, much wood having to be removed with an adze in order to make it so. The superior strength of split timber arises from all its fibres being kept unbroken; while, in such as is divided by sawing, many are cut through, owing to their irregular direction. From this circumstance split timber is preferred for the staves of barrels, sieve-hoops, and a variety of other purposes for which great strength and elasticity are required. For a notice of machines for cutting wood by means of knives or knife-like instruments, see WOOD-CUTTING MACHINERY.

Saws were used by the antient Egyptians. The annexed cut represents a saw that was discovered, with several other carpenters' tools, in a private tomb at Thebes, and which is now preserved in the British Museum.



The blade, which appears to be of brass, is ten inches and a half long, and one inch and a quarter broad at the widest part. The teeth are irregular, and appear to have been formed by striking a blunt-edged instrument against the edge of the plate; the bur, or rough shoulder, thus produced, not being removed. The following cut, from a painting copied in Rosellini's work on Egyptian antiquities, represents a man using a similar saw; the piece of wood which he is cutting being held between two upright posts. In other representations the timber is bound with ropes to a single post, and in one, also copied by Rosellini, the workman engaged in tightening the rope, having left the saw sticking in the cut. In an engraving given in the third volume of Wilkinson's 'Manners and Customs of the Antient Egyptians,' a saw is represented of much larger dimensions, its length being, by comparison with the man, not less than three or four feet. It does not appear that the Egyptians used saws worked by two men.



The invention of saws was variously attributed by the Greeks to two or three individuals, who are supposed to have taken the idea from the jaw-bone of a snake or the back-bone of a fish. There is a very curious picture among the remains discovered in the ruins of Herculaneum, representing the interior of a carpenter's workshop, with two genii cutting a piece of wood with a frame-saw; and on an altar preserved in the Capitoline Museum at Rome there is a perfect representation of a bow-saw, exactly resembling, in the form of the frame, and the twisted cord for tightening it, those used by modern carpenters. (*Mus. Capitolin.*, vol. iv., plate 15.) From these remains it is evident that these forms of the instrument were known to the antients.

Saws are of various forms and sizes, according to the purposes to which they are to be applied. Those used by carpenters and other artificers in wood are the most numerous. Among these are the following:—The *cross-cut saw*, for dividing logs transversely, two persons being employed to pull the saw alternately backwards and forwards, and the teeth being so formed as to cut equally in each direction. The *pit-saw*, a long blade of steel with large teeth, and a transverse handle at each end. It is used for sawing logs into planks or scantlings, the piece of wood to be cut being laid over a saw-pit, or excavation six or seven feet deep. One man stands on the log, and the other in the pit, and they pull the saw alternately up and down, in a nearly vertical direction; the saw cutting in its descent only. The *frame-saw* is a blade from five to seven feet long, stretched tightly in a frame of timber, the plane of the saw being at right angles with that of the frame. It is used in a similar manner to the pit-saw, but causes less waste, because the blade, being stretched, may be made much thinner. The *ripping-saw*, *half-ripper*, *hand-saw*, and *pannel-saw* are saws for the use of one person, the blades tapering in width from the handle. They are of different lengths, the longest being about twenty-eight inches; and the [illegible] rather more than one-third to one-sixth or [illegible] inch. *Tenon-saws*, *sash-saws*, *dovetail-s*[illegible] made of very thin blades of steel, of equal [illegible] their whole length, and stiffened with st[illegible] or brass fixed on their back edges. T[illegible] cutting across the grain, as in the shoulde[illegible] tail joints, &c., and for many other purpose[illegible] clean cut is required, but where it is not [illegible] whole width of the saw-blade to pass thr[illegible] Such saws vary in length from about six to [illegible] the teeth being from one-eighth or one-ten[illegible] down to a very minute size; extremely small [illegible] required for some of the most delicate operatio[illegible] binet-maker. *Compass* and *key-hole saws* are [illegible] saws, tapering from about an inch to an eighth [illegible] in width, used for making curved cuts. They [illegible] considerably thicker at the edge than at the back, [illegible] that they may move freely in a curved kerf, and th[illegible] is mounted in a long handle, having a slit to recei[illegible] blade, and a screw to fix it in any required place, so th[illegible] may be made to project more or less as required. Sa[illegible] *frame-saws* and *bow-saws*, in which very thin narrow bla[illegible] are tightly stretched, are occasionally used for cutting both wood and metal. Saws are made for cutting bone, iron, brass, and many other hard substances, and there are several varieties used by the carpenter besides what have been enumerated; but it is unnecessary here to detail them.

A minute account of the process of manufacturing saws, as practised at Sheffield, whence, it is observed, 'three-fourths of the inhabitants of the globe are supplied' with these useful intruments, is given in Hebert's 'Engineer's and Mechanic's Encyclopædia,' to which we are indebted for the following particulars. The very commonest kind of saws are made of iron-plates, hammer-hardened, and planished upon an anvil, to give them some degree of stiffness and elasticity. Such instruments, though spurned by workmen, are sold in great quantities, their cost being very trifling. The more useful saws are made either of shear or cast steel, of which the latter is preferred, on account of its greater uniformity of structure. The steel is cast in the form of a small slab, about an inch and a half thick. This slab is extended, by rolling, to the required degree of tenuity, and then cut, by shears, into pieces of suitable form and size. 'The edges are next perfected by filing, and holding the flat side of the plates against large grindstones, which process prepares them for the cutting of the teeth. This operation is usually performed by a die-cutter in a fly-press, the motion of the saw-plate being duly regulated, so that the teeth shall be uniform; the larger teeth being cut one at a time; and the smaller, two, three, or more at a time, according to circumstances.' The wire edges left on the teeth by the cutting-out press are removed by filing, after which the plates undergo the processes of hardening and tempering. Various fatty compositions have been used for this purpose, being considered to possess peculiar efficacy in hardening. Mr. Gill (in the 'Technical Repository,' vol. i., p. 212) recommends the following mixture as suitable not only for saw-plates, but for springs generally:—

Spermaceti oil	20 gallons.
Beef-suet, rendered . .	20 lbs.
Neat's-foot oil	1 gallon.
Pitch	1 lb.
Black resin	3 lbs.

The pitch and resin are to be melted together, and then added to the other ingredients, the whole being heated in an iron vessel until the aqueous vapour is driven off, and the composition will take fire on the application of flame to its surface; the flame being extinguished by putting on the cover of the vessel. The liquid mixture thus prepared is put into a vessel of suitable form, and, when cold, the saw-plates, which are heated to a cherry-red, are precipitated edgewise into it. When sufficiently cooled therein to be handled, they are taken out, and are found to be extremely hard and brittle. The unctuous matter which adheres to them being then partially removed, they are taken up individually by a pair of tongs, and passed backwards and forwards over a clear charcoal fire, so as to cause the unctuous matter to inflame, or *blaze off*, as it is termed, which reduces the saws to the required temper; and, whilst the saw-plates remain hot, any warping they may have acquired in the process is removed by smart blows from a [illegible] strewed with sand to prevent their [illegible] about. The next operation is planishing by hammers, to make them more even and equally elastic; after which the saws [illegible] ground on large grindstones. The [illegible] is held against the circular face of the stone by an interposing board, against which the grinder presses with all his force, [illegible] order to grind it as evenly as possible. He stands on [illegible], stretching over the stone, which revolves with great rapidity; his hands, arms, breast, and knees being all brought into action to produce the desired effect, while [illegible] becomes covered with the sludge formed by the [illegible]

[illegible] process of grinding impairs the flatness and elas- [illegible] the saw-plates, they are submitted to a second [illegible]ring by the planishers, and their elasticity is restored [illegible]ating them over a coke fire until they attain a faint [illegible]-colour. The marks of the hammer are removed by passing the saws lightly over a grindstone, after [illegible]e final polish is given by a fine hard stone, a glaz- [illegible] covered with buff-leather and emery, or a [illegible]eel, called the *hard-head*. Any defects acquired [illegible]se processes are removed by a few blows with a [illegible]mall polished hammer upon a post of hard wood.

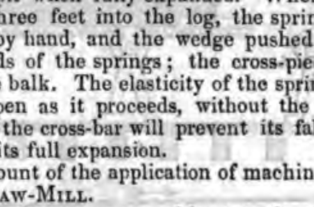
The saws are 'cleaned off' by women, by rubbing fine mery over them lengthwise with a piece of cork-wood; nd then handed to the *setter*, who lays each alternate ooth over the edge of a small anvil, and strikes them so s to bend each uniformly into a slight deviation from the lane of the saw, and then, turning the saw-plate, sets the emaining teeth in like manner, but in the opposite direction. Owing to this set of the teeth, the kerf or cut made y the saw is rather wider than the thickness of the blade, which therefore passes through it with little resistance. The degree of deviation from the plane of the saw depends upon the kind of wood to be cut; the softest wood requiring the widest or *rankest* set. Sometimes an instrument with a notched edge, called a *saw-wrest*, is used for setting he teeth, each being separately bent to the required legree, or, in some cases, two or more at a time; and recently an ingenious contrivance resembling a pair of plyers, and having a stop-screw to regulate the degree of set, and a moveable plate to prevent too much of the tooth being bent, has been introduced. It may be observed that the mode of performing this operation with a hammer has been considered to have an advantageous effect in hardening the teeth. After being set, the saw is placed, between two plates of lead, in a vice, and the teeth are sharpened with a triangular file. The handles are then fixed on by nuts and screws, and the saws cleaned off, oiled, and packed in brown paper for sale.

The common test of a good saw is bending it into a bow, and letting it spring back again into a straight line. It is a satisfactory test of perfect elasticity and uniformity of thickness in the blade, which are two of the essential properties of a good saw; but it is considered by some to be an unnecessary trial, and to spoil saws which possess, in other respects, the qualities of a good tool.

The teeth of carpenters' saws are so formed as to contain an angle of 60°, and they are made to incline more or less forward according to the intended use of the saw. Ripping-saws have the front of the teeth perpendicular to a line ranging with their points; but those for cutting across the grain, or for hard wood, must have the front of the teeth more or less inclined towards that imaginary line. Very small thin saws are sometimes made with the teeth of such a form that they cut towards, instead of from, the person using them; an arrangement which counteracts the tendency to bending consequent on the thinness of the plate. For very delicate operations saws are frequently made of watch-spring.

Circular saws, being used only in connection with machinery, are described under SAW-MILL. It has been recommended to file their teeth in such a manner that their surfaces may not be perpendicular to the face of the saw, but inclined in the direction that the teeth are set; so that the teeth, when cutting, first remove the wood from the sides of the kerf, leaving a little ridge in the centre, which tends to keep the saw steady in its course.

In cutting a log into planks with a pit-saw, it is necessary to insert wedges in the kerf, in order to keep it open, and allow free passage for the saw. To save the trouble and inconvenience of shifting these as the saw proceeds, Mr. Griffiths invented an expanding wedge, for which he received a reward from the Society of Arts. It is represented in the annexed cut, *a* being the handle, *b b* two springs, and *c* a cross-piece to prevent the wedge from falling into the pit when fully expanded. When the saw has cut two or three feet into the log, the springs are to be compressed by hand, and the wedge pushed into the cut up to the ends of the springs; the cross-piece resting on the top of the balk. The elasticity of the springs will cause the cut to open as it proceeds, without the wedge being moved; and the cross-bar will prevent its falling when it has attained its full expansion.



For an account of the application of machinery to sawing timber, see SAW-MILL.

Saws for cutting stone are without teeth, although they are sometimes slightly notched upon the cutting edge, that they may collect and retain the particles of sand that are conducted into the cut by a small current of water, and by the attrition of which the effect is mainly produced. The saw-plate is tightly stretched in a kind of rectangular frame, of which it forms the lower side; and the frame, being suspended by ropes, is moved backwards and forwards by one or two men. A board is laid sloping towards the cut, to conduct a constant supply of water from a reservoir, and a quantity of sand is laid on the board, so that the operator can, by means of a hooked stick, draw a little into the stream of water when necessary. Coarse sharp sand is used for cutting soft stones, and fine sand for those of harder quality; the sand being in all cases carefully cleaned and sifted. Sawing stone is a very slow and laborious operation; a good workman not being able to cut more than twenty-five or thirty square feet of Portland stone in a day; and, as commonly practised, it involves considerable waste of material, owing to the tendency of the saw to swerve from the right direction when the stone is not uniform in hardness. The defects of the common process have been partially avoided, of late years, by the use of stone-sawing machinery, worked by steam or water power, in which the effect is so much increased by greater pressure upon the saws, that, according to the 'Encyclopædia Metropolitana,' one saw performs as much work in seventy hours as a man in six weeks, and with such accuracy that the surface scarcely requires any dressing. As in saw-mills for wood, any number of saws may be worked together, so adjusted as to cut a block of stone into slabs of any required thickness. Curved forms may be cut in stone by means of straight saws; but a patent was obtained in 1810, by Mr. Murdock, for cutting columns, stone pipes, &c. by means of a cylindrical saw, so mounted as to receive rotatory motion alternately in each direction; such a motion being found more suitable for cutting stone than a continued rotation in one direction.

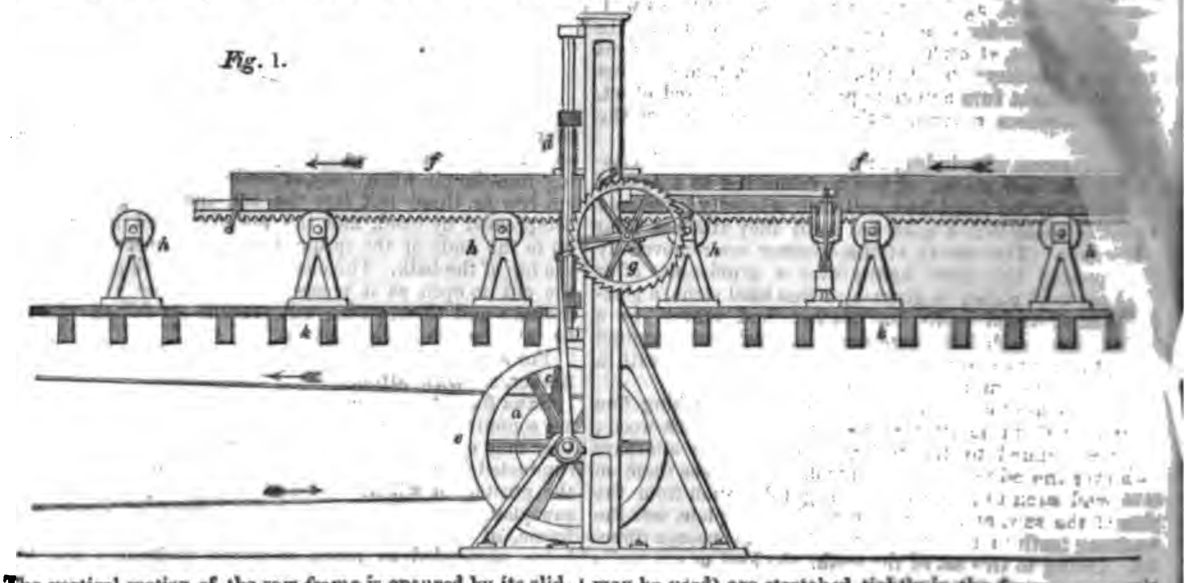
SAW-FISH, a fish belonging to the fixed-gilled Chondropterygians, nearly related on the one hand to the Sharks (*Squalidæ*), and on the other to the Rays. [SQUALIDÆ.]

SAW-MILL. In this article will be embraced not only such points in the mechanism of saw-mills, strictly so called, as appear to require notice, but also some other contrivances in which saws are used in connection with machinery, and not simply as tools impelled and guided by the hand. Saws, considered merely as tools, have been described under SAW, where an account of their manufacture will also be found.

Although saw-mills have not been very generally introduced till within a few years, they are by no means of recent origin. Saws worked by machinery were known on the Continent at least as early as the fifteenth century, though the improvement of having several saws in the same frame, so as to cut a log into many planks by one operation, is supposed not to have been tried prior to the sixteenth century. Notwithstanding their successful use in Germany, Holland, Norway, and other places, the introduction of saw-mills in England was much opposed. One was erected near London in 1663, by a Dutchman; but it was soon abandoned. In No. 419 of Houghton's 'Collection for Improvement of Husbandry and Trade,' published August 2, 1700, the adoption of saw-mills in this country is strongly recommended, although some opposition from the populace is mentioned as not improbable. About the year 1767 or 1768 a saw-mill was established at Limehouse, under the sanction of the Society for the Encouragement of Arts, Manufactures, and Commerce. It was driven by wind, and superintended by a person who had become acquainted with the use of saw-mills on the Continent. This mill was destroyed by a riotous mob; but the ringleaders being severely punished, and the damage made good by the county, it was again set up, and soon followed by others, particularly after the improvement of the steam-engine made it available as a moving power. A similar mill is said to have existed a few years previously at Leith. Many of the earlier saw-mills were driven by water, and those of North America are still generally worked by that power.

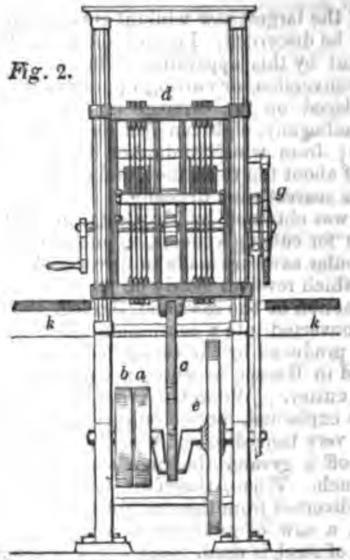
The earliest kind of sawing-machinery was, in its essential features, the same as that still used for sawing logs of timber into planks. In this machine the saws are stretched in a frame which slides up and down on vertical guides; the reciprocating motion being imparted to the frame by a crank upon an axle turned by a connection with the water-wheel or other prime mover. The log is supported on a carriage resting upon rollers, and is made to advance a little at each stroke of the saws, which cut during their descent only. *Figs.* 1 and 2 represent the common reciprocating saw-mill, the same letters in both referring to corresponding parts. The machinery, in the form here represented, occupies two stories; the cast-iron framing being securely bolted down to the basement floor, and rising through the upper floor, which is shown in section at *k k*. An horizontal axle, revolving in bearings attached to the lower part of the framing, is turned by means of a strap from the axle immediately impelled by the steam-engine, water-wheel, or other moving power. Two drums or riggers are used, that marked *a* being *fixed* on the axle, while the other, *b*, revolves freely; the driving strap being shifted to this loose rigger when it is desired to stop the machine without stopping the engine that propels it. In some of the earlier saw-mills the motion was communicated by a train of cogged wheels; but straps are preferable, as they occasion less friction, and, in case of any accidental obstruction to the machinery, will give way without injury, while cog-wheels would be broken to pieces. It may be observed here, that important advantages have been de[illegible] the recent introduction of straps or bands f[illegible] of caoutchouc, for driving machinery; as the [illegible] renders them much more effective and durable th[illegible] of leather, and obviates the inconvenience of slippin[illegible] the pulleys, to which the common bands are liable wh[illegible]ed with use. The axle, being cranked, imparts a reciprocating motion to the saw-frame *d*, by means of the connecting-rod *e*.

Fig. 1.



The vertical motion of the saw-frame is ensured by its sliding up and down upon smooth pillars or guide-rods attached to the frame-work of the machine; these being usually made square, that the parts sliding upon them may be screwed up so as to fit accurately when reduced by wear. In some machines friction-rollers are used instead of mere slides for guiding the saw-frame. The saws (of which eight are represented in *Fig.* 2, although a smaller number may be used) are stretched tightly in the frame, commonly by means of wedges driven through mortise-holes in their upper end. In the saw-mills erected at the Royal Arsenal, Woolwich, by Mr. (now Sir M. I.) Brunel, an ingenious apparatus is used to stretch the saws equally. At each end of every saw is a piece of iron terminating in a hook. The hook at the lower end of the saw catches upon the lower cross-bar of the saw-frame, and that at the upper end is connected with

Fig. 2.



:le hanging on the upper cross-bar, and capable of
ightened by wedges. When it is desired to fix or
the saws, the saw-frame is raised to the highest
; the crank will allow, and held securely in that
while a steelyard, loaded to the degree necessary
uce the required tension, is connected with the
of each saw successively; and, while they are thus
d. the wedges are pushed in by hand. The saws are
el, and at the required distance apart, by placing
at top and bottom, pieces of wood of the
of the intended planks, with similar pieces out-
then screwing the whole firmly together.

saws cut only in their descent, and the resistance
come is therefore very unequal, it is necessary to
wheel, *e*, to the machine, and to load its periphery
manner as to produce as equable a motion as pos-
tempts have been made to introduce sawing-ma-
h two sets of saws, one of which should cut *up*-
t they do not appear to have succeeded. A similar
ometimes produced by connecting two machines
xle; the cranks being so adjusted that one saw-
ends while the other rises. As some incon-
ay be occasioned by the common arrangement of
in which several machines are impelled by one
when the different quality of the wood to be cut, or
rcumstances, may render various rates of speed de-
it proposed, in a patent obtained by Mr. M'Dowall,
to work each saw-frame by a separate steam-engine,
of which might be regulated without interfering

ks of timber to be divided into planks, of which
enerally operated upon simultaneously, are repre-
a section in *Fig*. 2, and one of them in profile at
1. They are supported by rollers, *h h*, and secured
nds by suitable fastenings to a long iron carriage
of passing through the saw-frame, and having a
rack along its under side. *g* is a ratchet-wheel,
y the intervention of a pall, connected with an ec-
on the main axle of the machine, is turned a little
xis during each descent of the saw-frame. The axle
wheel extends completely across the machine, and
othed pinion working into the rack on the under
the timber-carriage, which is thereby moved a little
irection indicated by the arrows in *Fig*. 1, at every
rd stroke of the saws. Thus the carriage and balks
er are propelled forward as fast as the wood is cut;
en the planks are completely divided, they are re-
rom the carriage, which is returned to its original
1, ready for the next operation, by turning a winch-
on the end of the axis bearing the ratchet-wheel *g*,
ls or detents of which are turned back to allow it
n); or, in some machines, by connecting the axle
engine in such a manner as to obtain a reversed

In order to keep the balks of timber steady dur-
cut, their inner sides slide against polished steel
xed to the frame-work of the machine, against which
pressed by rollers held in contact with their outer
weighted levers, one of which is shown at *i*, *Fig*. 1.

In the saw-mills erected at Woolwich by Brunel, to which allusion has been made before, a contrivance is added to allow the saw-frame to retreat backwards a little in its ascent, that the teeth may not touch the wood when not cutting. An American inventor, in a patent obtained about 1836, proposes to sharpen the back of about every third tooth of the saws to a knife-edge; the cutting-edges being alternately towards each side of the saw. By this means the saws, during their ascent, shave or as it were *plane* the cut surfaces, and leave them much smoother than when of the ordinary kind.

As in all reciprocating machinery, much power is lost in the apparatus just described, in consequence of the alternating motion. This circumstance also limits the speed of the saws, while the rapidity with which the work is performed is further retarded by the saws cutting in one direction only, one-half of the time being occupied in the ascent of the saw-frame to bring it into the position for making an effective stroke. These circumstances have led to the use of circular saws, which, by revolving constantly in one direction, require less power, and may be driven with far greater speed than reciprocating saws; while their continuous action not only expedites the operation of sawing, but also makes the motion of the machinery more uniform. Circular saws have therefore been very extensively applied to the more delicate kinds of sawing within the last thirty or forty years, although it does not appear to be known by whom they were first applied to the cutting of wood. It is said that circular saws were used for cutting the teeth of watch and clock wheels long before they were used for other purposes. Perhaps the most interesting kind of circular saw is that used for cutting logs of hard wood into veneers. Brunel, to whom England is indebted for many valuable improvements in this class of machinery, took out a patent in 1806 for a method of constructing very large circular saws by attaching several pieces of steel plate to a flanch of iron turned perfectly true. In this way saws have been made of as much as eighteen feet diameter; but such large saws can only be used for cutting veneers or very thin boards, which will easily bend so as to pass the flanch of the saw, which is necessarily of considerable thickness. *Figs*. 3 and 4 present side and end elevations of a circular veneering-saw, as used at the City Saw-Mills, to the proprietors of which, Messrs Esdaile and Margrave, the writer is indebted for the facilities so liberally accorded to him in the inspection of their interesting works. As in the former illustrations, the same letters refer to corresponding parts in each view of the machine. *a* is the saw, consisting of a

Fig. 3.

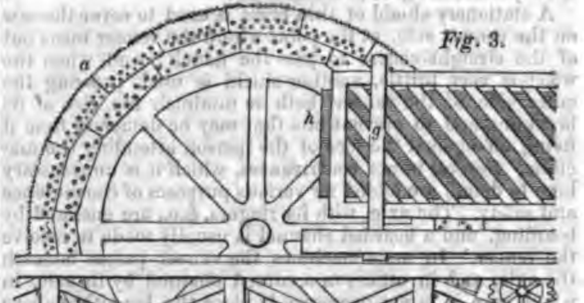
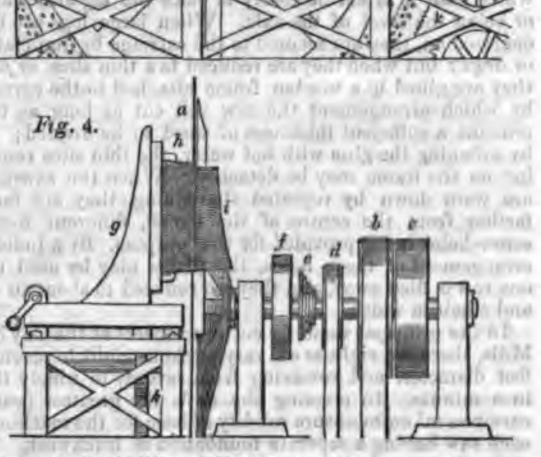


Fig. 4.



number of plates about twenty inches long, and from six to ten inches wide, secured by screws to another set of plates that are firmly attached to the flanch or foundation, which is of cast-iron, very thick in the centre, and tapering to a thin edge. The outer side of the flanch, or that along which the log to be cut has to pass, is made either quite flat or slightly concave. When the saw is very large, the lower part, as shown in the diagrams, passes through the floor of the room. The saw is mounted on one end of an axle, revolving in firmly secured bearings. *b* is a rigger fixed on the axle, to receive motion, by means of a broad strap, from the engine; and *c* a loose rigger, to which the strap is shifted when it is necessary to stop the saw. As the mere cessation of the moving power would not stop the machine as quickly as is desirable, a wooden wheel *f* is added, to the periphery of which an iron strap may be pressed by a lever so as to arrest its revolution, and bring the machine to a stand. The log to be cut, which is marked *h*, is fixed to a carriage *g*, which slides on a kind of railway elevated on a substantial framework. The under side of the carriage is supplied with a rack, working into a pinion at *k*, to which motion is imparted by a train of wheels, partly under the floor, and turned by a strap from the rigger *d*, on the axis of the saw; *e* is a wheel with several grooves of different diameters, by a band from which an apparatus (not shown in the cuts) is moved for regulating the velocity with which the carriage is propelled. By means of screws turned by a handle attached to the carriage, the log is made to project beyond the plane of the saw in a trifling degree; and then the attendant throwing the pinion *k* into gear, the carriage with the log upon it is steadily moved along its railway, while the thin and flexible veneer separated by the saw slides along the convex side of the saw-flanch at *i*. When the carriage has traversed the whole length of the log, the detached veneer is carefully removed, and the carriage brought rapidly back to its original situation by reversing the motion of the pinion; a process readily effected by means of a clutch-box beneath the floor, with a handle brought to a convenient situation for the attendant. The apparatus which imparts a transverse motion to the log is then again moved, so as to project the log sufficiently beyond the plane of the saw to allow another veneer to be cut off, and the same process is again gone through.

A stationary shield of thin brass is used to cover the saw on the convex side, at the point where the veneer turns out of the straight course to pass the flanch; and, when the wood is very brittle, another shield is used, pressing the outer side of the veneer, both to diminish the risk of its breaking, and to prevent bits that may be detached from it flying off against the face of the person attending the machine. Several minor contrivances, which it is unnecessary here to detail, are added for various purposes of convenience and safety. The axle, with its riggers, &c., are enclosed by boarding, and a boarded channel is usually made to receive the veneer. In some machines the veneer passes beneath the axle, and in others in a curved channel by its side, in which case it is not necessary to place the log either above or below the level of the axle. When large logs are to be operated on, they are secured to the carriage by iron clamps, or *dogs*; but when they are reduced to a thin slice, or *flitch*, they are glued to a wooden frame attached to the carriage, by which arrangement the saw will cut as long as there remains a sufficient thickness of wood to be divided; and, by softening the glue with hot water, the thin slice remaining on the frame may be detached. When the saw-plates are worn down by repeated sharpening, they are moved farther from the centre of the flanch, different rows of screw-holes being provided for that purpose. By a judicious arrangement of these holes, the plates may be used until one row is filed away, and they are reduced to about an inch and a half in width.

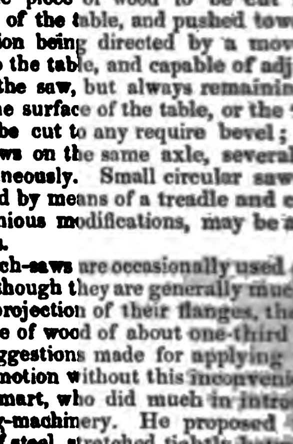
In the principal room for cutting veneers at the City Saw-Mills, there are eight saws, varying from eight to seventeen feet diameter, and revolving from seventy to ninety times in a minute. In erecting the mills the greatest possible care was taken to ensure solidity of base for the machinery; each saw having a separate foundation of brickwork. The necessity for such precaution may be readily conceived when the size of the saws is considered, and it is remembered that they are to cut from ten to fourteen veneers out of an inch of wood; and so completely has the desired solidity and steadiness been attained, that when the eye is brought into the plane of the largest saw while it is revolving, [illegible] can scarcely be discerned. Logs of about five feet diameter have been cut by this apparatus. The writer was present during the conversion, or cutting up, of the largest log that had been placed on the carriage in one piece,—a log of Honduras mahogany, eighteen feet long and three feet one inch square; from which unbroken sheets were taken off at the rate of about ten to an inch, and so beautifully smooth as to require scarcely any dressing.

A patent was obtained by Mr. Craig, in 1831, for several contrivances for cutting veneers, in one of which a number of small circular saws are made to traverse the whole length of the log, which revolves slowly on its axis; so that, by the combined motion of the saws and the log, the whole piece of wood is converted into a continuous spiral veneer, resembling those produced by the celebrated veneer-cutting machinery used in Russia, in which a knife-edged instrument is used as a cutter. [WOOD-CUTTING MACHINERY.]

As before explained, large circular saws are only adapted for cutting very thin slices or boards; they are never used for cutting off a greater thickness than half an inch, and rarely so much. When, therefore, the piece cut off is too thick to be diverted from the straight line to pass the flanch of the saw, a saw of much smaller size, and formed of a single plate of steel, is used. Such a saw is usually mounted in a bench or table, under which the axle passes, and having a slit or opening through which the upper part of the saw projects. The saw is kept steady by means of two thick plates or flanges of iron, about one-third its diameter, one of which is screwed tightly up to each side of the plate. The true motion of the saw is sometimes further provided for by means of adjusting screws inserted in the bench, in such a manner as to confine the saw-plate very near its periphery. The piece of wood to be cut is laid on the smooth surface of the table, and pushed towards the saw by hand; its motion being directed by a moveable guide or rule screwed to the table, and capable of adjustment to any distance from the saw, but always remaining parallel to it. By inclining the surface of the table, or the [illegible] of the saw, the wood may be cut to any require bevel; and by fixing two or more saws on the same axle, several pieces may be cut off simultaneously. Small circular saws, so mounted, are often moved by means of a treadle and crank, and, by a variety of ingenious modifications, may be applied to many useful purposes.

Circular bench-saws are occasionally used of [illegible] feet diameter, though they are generally much [illegible] owing to the projection of their flanges, they [illegible] through a piece of wood of about one-third [illegible] Among the suggestions made for applying [illegible] of continuous motion without this [illegible] the late Mr. Smart, who did much in [illegible] proving sawing-machinery. He proposed [illegible] endless band of steel, stretched tightly [illegible] and toothed on one edge; by which an [illegible] duced similar to that of two straight saws, [illegible] ting downwards and the other upwards. [illegible] was patented in 1824, by Messrs. Sayner [illegible] by which timbers of large size may be cut [illegible] saws, each cutting, as represented in *Fig* [illegible] than half through the log. It was proposed in this patent to cut several planks at once, by fixing a number of saws on the same axle, separated by flanges of the thickness of the intended planks; and when the planks are to be subdivided into scantlings or laths, to employ a series of horizontal saws fixed upon a vertical axis, to cut the planks as soon as they leave the first set of saws.

Fig. 5.



In the beautiful and ingenious block-machinery erected at Portsmouth by Brunel, saws are extensively applied. For dividing large logs transversely into pieces of any required length, a large cross-cut saw moved backwards and forwards by machinery in a similar manner to the usual mode of working such by hand, is used; but for cut-

smaller blocks a circular saw is employed, mounted in
a manner that it may be applied to any side of the
the saw always continuing in the same plane. *Fig.* 6
sents the contrivance by which this is effected, omit-
every part not essential for explaining the manner in
h the saw is moved. *a* is the log to be cut, supported

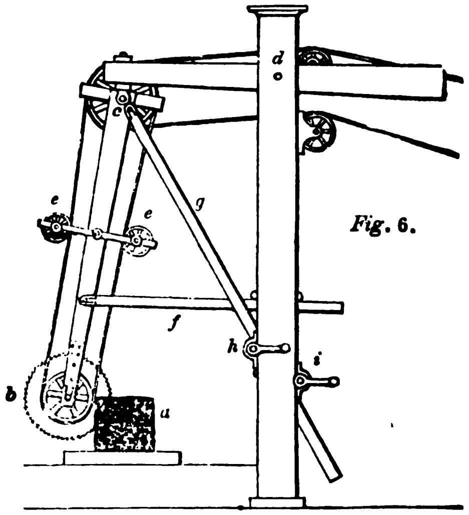
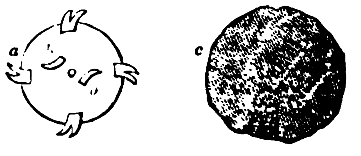


Fig. 6.

'rame which allows the saw to be brought in contact
the log in any direction; *b* the saw, fixed on the end of
le supported by a swinging frame, pivoted at *c* to the
of another moveable frame vibrating on an axis at *d*.
notion is communicated by a strap passing over guide-
s near the axis *d*, to a wheel on the axis *c*; and from
nd wheel on the axis *c*, also by an endless band, to a
on the axis to which the saw is attached. *e, e*, are two
wheels made to press against the last-mentioned
when it is necessary to tighten it. *f* and *g* are rods
o guide the saw-frame, the former affecting its motion
ntally and the latter vertically; these rods being
l by racks attached to them, working into pinions
l by the handles *h* and *i*. When the log is properly
ed, the attendant, by moving the handles *h* and *i*,
the saw successively in contact with each of its sides;
ius, as it will cut in any direction as far as the centre
log, it will divide a piece of wood of nearly its own
ter. This apparatus is used for cutting elm for the
of the blocks, and a somewhat similar contrivance is
d for dividing lignum vitæ into suitable pieces for the
s. In it the saw is placed horizontally, its axle being
il, and attached to a frame which moves on a vertical
ike a door on its hinges. The log, which is placed
illy, is made to revolve slowly, so as to present every
the saw, which is pressed against it by a lever at-
l to the frame. Of these and several other sawing-
nes a very full description is given by Farey, in his
it of the block machinery, in Rees's 'Cyclopædia,'
Machinery.'

Eastman, of the United States, patented some curious
cations of sawing machinery about 1824. He found
hen a circular saw is propelled with great velocity, it
ut much more smoothly and easily if it have only a
eth placed at equal distances round its circumference
f, as usual, its periphery be full of teeth. *a*, *Fig.* 7,
ents this kind of saw, which has four cutting instru-
called *section teeth*, each consisting of two teeth re-

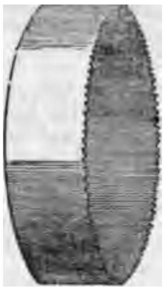
r. 7.



ing a hawk's bill in form. The saving of labour as
red with a common saw is estimated at full three-
s, and it is stated that, when driven at a proper speed
is from a thousand to twelve hundred revolutions
nute), it will cut nine or ten inches in depth into the
t white oak timber with the greatest ease. Mr. East-
ontrived these saws for cutting up timber in an unusual way, not through the log, but from the circumference to the centre; so that the cuts form the radii of a circle, and the planks or boards produced are thicker at the outer than the inner edge. *c*, *Fig.* 7, is an end view of the log showing a few cuts of the saw. It is laid on a carriage which moves it towards the saw, and is so fixed that at the conclusion of one cut it turns a little upon its axis to prepare it for the next. To make the outer edges of the planks smooth and uniform, a pair of teeth called *sappers* (marked *b*, *b* in the cut) are screwed to the side of the saw; and these remove one or two inches of the sap or soft outer wood from each plank. When the log is of sufficient size, a second set of cuts may be made, after removing the planks formed by the first operation. The boards cut by this machinery are much used for covering buildings, for which their feather-edged form especially adapts them; and they are found to withstand the influence of the weather far better than others; a circumstance readily accounted for by the fact, which may be observed in a stick of timber that has been exposed to the weather, that all cracks caused by shrinkage tend towards the centre of the tree, or in the direction in which these boards are cut.

All the varieties of apparatus that have been described are for the purpose of making *straight* cuts; but it is sometimes desirable to produce *curved* forms by sawing, for which purpose there are several ingenious contrivances. In 1806 the Society of Arts rewarded Mr. Trotter for the invention of a concave circular saw, resembling a watch-glass in form, which was mounted in a bench like the common bench-saw, and to which the wood was directed by curved guides. Many useful forms are cut by a saw consisting of a cylinder of steel, toothed on the edge, as represented in *Fig.* 8. Such saws, which are called crown or curvilinear saws, or, from their resemblance to the saws used in the operation of trepanning, *trepan* saws, are used for cutting circular pieces of wood to form the sheaves of blocks; and, when of larger dimensions, for cutting chair-backs, felloes of wheels, curved brush-handles, &c. For these purposes they are sometimes used as much as five feet in diameter. In the machine patented by Mr. Dodds, in 1835, an arrangement resembling the common reciprocating saw-mill is applied to curvilinear sawing, by causing the carriage on which the timber is supported to deviate from the straight course, and follow the curvatures of a model of the required form; while the saws, being attached to the frame by pivots, are capable of adapting their position to the curve. This machine is applicable in many cases in which neither of the preceding would be available; and, by using several saws, many pieces of wood may be cut together.

Fig. 8.



SAXE, MARSHAL. MAURICE, COUNT OF SAXONY, was the natural son of Augustus II., king of Poland and elector of Saxony, and of the countess of Kœnigsmarck, a Swedish lady of high rank. Maurice was born at Dresden, October 19, 1696. In 1708, when only twelve years old, he served in the army of the allies under the count of Schulembourg before Lisle; in 1709 he had a horse shot under him at the siege of Tournay; and he was at the battle of Malplaquet in the same year. His father soon afterwards gave him a regiment of cavalry, with which he fought against Sweden, and was at the taking of Stralsund. When he was only fifteen years of age his mother got up a marriage between him and the heiress of the counts of Loben, a German lady, who was about the same age.

When Prince Eugene was besieging Belgrade he was joined by Maurice of Saxony, who, when the campaign was terminated, returned to Dresden, and after a short stay repaired to Paris (1720), where he was introduced to the duke of Orleans, then regent, who received him in the most flattering manner, and conferred on him the title of Mareschalde-Camp. On his return to Dresden to ask his father's permission to accept the dignity, he contrived to separate himself from his wife by procuring a divorce. No blame is imputed to her except jealousy, for which there was no doubt sufficient cause, constancy in his attachments to the other sex being by no means one of the characteristics of Maurice. He soon returned to France, and took the command of a regiment, which he manœuvred according to a plan of his own, and for which he received the praise of Folard. He continued for a considerable time to study mathematics and the art of attacking fortified places under that skilful tactician.

In the year 1726 Maurice of Saxony set out for the north, in the hope of being elected duke of Courland through the interest of his father. By the exertions of Anna Iwanowna, duchess of Courland (widow of the duke Frederic-William, who died in 1711), who had conceived an attachment to him, his election was carried, though there were other candidates, and he was opposed by the czarina Catharina I., who sent Menzikoff to seize him in Mitau; but he defended himself in the palace, and the Russians retired. The Russian influence was then used in the Polish diet, which, in virtue of its right of suzereignty, summoned him to appear before them, but he refused to do so, and the diet in consequence signed his proscription. He attempted to defend himself in his territory, but the Russians forced him to flee, and he escaped to France with nothing but his diploma of election. In 1728, after the death of Catharina I., the duchess of Courland, whose attachment to him continued, invited him to return, which he did, and there is little doubt that she would have made him her partner on the throne of the czars, to which she was elected in 1730, if she had not previously discovered a glaring instance of his inconstancy, whereupon he was immediately dismissed. He then returned to Paris, and afterwards repaired to Dresden. His father, Augustus II., died in 1733.

War having been declared between France and Austria in 1733, Maurice of Saxony repaired to the court of Versailles to solicit employment, and he was sent to the army of the Rhine, commanded by the duke of Berwick. He distinguished himself at the siege of Philipsburg, and was appointed lieutenant-general at the peace of 1736. He now returned to Dresden for the purpose of prosecuting his claim to the dukedom of Courland, but failing in this attempt, he went again to Paris, and devoted himself to the study of the art of war and to the completion of a work on which he had employed himself for some time, and which he called 'Mes Rêveries.'

On the death of the emperor Charles VI. in 1740, a general war broke out. Louis XV. sent an army into Bohemia under the marshal of Belle-Isle, the left wing of which was confided to the Count of Saxony, who was charged with the investment of Prague (1741), which he took by assault in a few days, and with equal rapidity the fortress of Egra. He was afterwards appointed to the command of the army of Bavaria, and displayed equal skill in defensive warfare as in offensive. He was also employed in the defence of Alsace, when he was suddenly summoned by Louis XV. to assist in placing Prince Edward the Pretender on the throne of his ancestors, but he had scarcely reached Dunkirk when a tempest destroyed a part of his squadron, and the rest was blockaded by an English fleet. Maurice returned to Versailles, and Louis bestowed on him the staff of a Marshal of France (March, 1743).

In 1744 Louis XV. entered Flanders with an army of 80,000 men, the left wing being under the command of Marshal Saxe, who was appointed to cover the sieges which were to be undertaken by Marshal Noailles under the immediate inspection of the king. Menai, Ypres, and Furnes were quickly gained, when news was brought that Prince Charles had entered Alsace. The king and Marshal Noailles hastened to its defence with the greatest part of the troops, leaving Marshal Saxe alone in Flanders to act on the defensive against an army three times as numerous as his own; he maintained his position however with consummate skill, keeping the allies continually in check, and retaining the conquests which had been made at the beginning of the campaign.

In 1745 Louis XV. returned to Flanders with a large additional force, amounting, with that already in Flanders, to 100,000 men, of which Marshal Saxe was now appointed general-in-chief, Marshal Noailles consenting to act under him. On the 22nd of April, 1745, the campaign was opened by the siege of Tournay. The allies ad [illegible] with 45,000 men, English, Hanoverians [illegible] Saxe was suffering under dropsy, and [illegible] tion of tapping on the 18th. Notwitl [illegible] to oppose the allies with a force [illegible] himself being obliged to be borne [illegible] a lit [illegible] of May he was attacked near the village of [illegible] he had put himself in position. The Engl[illegible] verians advanced to the attack of his redoubts [illegible] column, and for awhile bore everything before th[illegible] taining repeated attacks of cavalry and the steady [illegible] interrupted fire of the French infantry with a de[illegible] which seemed to make victory certain. But the [illegible] of Marshal Saxe at length prevailed; the Dutch [illegible] and four large pieces of artillery being also br[illegible] upon the English column, it was at length [illegible] give way, and defeat followed. The French vi[illegible] tenoy, one of the most memorable of the [illegible] tury, was soon followed by the conquest of al[illegible] conqueror of Fontenoy was presented by Lou[illegible] the château of Chambord, and 100,000 francs [illegible] revenue arising from the estate. Tournay, Ghe[illegible] Oudenarde, Ostend, Brussels, Mons, Charleroi, [illegible] were all taken between May 23, 1745, and Sept. 19, 17[illegible]

In the campaign of 1747 Marshal Saxe took Laf[illegible] a hard-fought battle (July 2), which he followed [illegible] conquest of Bergen-op Zoom, and in 1748 by the [illegible] tricht. The allies now made overtures of peace, [illegible] was definitely settled at Aix-la-Chapelle in the same [illegible]

Marshal Saxe survived about two years to enjoy [illegible] honours which were lavishly showered upon him. He died November 30, 1750.

Marshal Saxe's work, 'Mes Rêveries,' was published [illegible] 1757, 5 vols. 4to. It is a work on military affairs, which [illegible] said to contain a good deal of valuable matter mixed up with many assertions which cannot be relied on. It was translated into English by Sir William Fawcett, 'The Reveries; or, Memoirs upon the Art of War, by Field-Marshal Count Saxe; translated from the French,' 1757, 4to.

Marshal Saxe was a soldier, and 'a ripe and good one,' but nothing more. When at the height of his [illegible] station, the Académie Française absurdly offered to [illegible] him a member, which he had the good sense to dec[illegible] he had great knowledge of his art and of [illegible] nected with it, his literary acquirements [illegible] no honour to that learned body, if we may [illegible] following specimen of his orthography given [illegible] graphie Universelle:' 'Ils veule me fere [illegible] sela miret come une bage a un chas.' The [illegible] man of large size and extraordinary personal [illegible]

(*L'Art de vérifier les Dates; Biographie U*[illegible]

SAXE-ALTENBURG, a small duchy on [illegible] frontiers of the Thuringian Forest, consi[illegible] divisions; the eastern along the banks [illegible] the western, which is traversed by the Sa[illegible] are separated by the intervening territory of [illegible] eastern is bounded on the north-east and [illegible] kingdom of Saxony, on the south-west by [illegible] west by Reuss, and on the north-west by Prussia [illegible] the western division is bounded on the north by [illegible] Saxony, on the east by Reuss, on the south east [illegible] by Weimar, and on the south-west by Coburg and S[illegible] burg. The duchy lies between 51° and 53° N. [illegible] and 13° E. long. The area is 453 square miles. T[illegible] mild and salubrious. The country is hilly, richly [illegible] and fertile. It is also favourably situated for commerce [illegible] on the whole it is one of the most flourishing and best cultivated of the German states. The hills in the eastern division are gentle undulations, and covered with forest-trees, those in the western chiefly with pines. The highest points, the Dolenstein near Kahla, and the Buchberg, are however not above 1000 feet high. Insulated branches of the Thuringian Forest run north east as far as the duchy of Altenburg, where the valley of the Saale separates them from the low hills of the duchy. The rivers, which are very inconsiderable, and all tributaries of the Elbe, are the Saale, with the Orla and Roda, and the Pleisse, which is properly the river of the country, with its small tributary streams [illegible] Sprotta and Gerstenberg. There are several large lakes, and also mineral springs, the most celebrated of which [illegible] that at Ronneburg. The soil is highly favourable to the cultivation of corn (particularly rye and wheat), pulse, [illegible] tatoes, rape-seed, flax, and hemp. The natives of Alteo[illegible] excel the other Saxons in agriculture, and are considered inferior only to the farmers of Holstein and Belgium. They also pay much attention to the rearing of cattle; their sheep are of a superior breed, and the horses of a remarkably strong make, swine are abundant, also wild boars, and deer. Fruit is very plentiful, and much improved since the establishment of an horticultural society. There are but few minerals. Attempts are now making to work the iron-mines in the vicinity of Ronneburg; the extensive peat-fields near Altenburg yield abundance of fuel. A very fine porcelain earth is also found in the neighbourhood of Altenburg, which supplies the famous porcelain manufactory at Gotha. Manufacturing industry is chiefly confined to woollen cloths, stockings, and wooden-wares. There are considerable tanneries at Altenburg, Kahla, Eisenberg, and Lucka. The articles of export are corn, cattle, wool, butter, and timber.

The duchy contained, in 1838, a population of 121,590, of whom 71,519 were Wends, who are distinguished by their pecular costume and manners. The inhabitants profess the Protestant religion, and the number of Roman Catholics does not exceed 200. The duchy contains 8 towns, 2 market-towns, 458 villages, and 19,856 houses. With regard to education, Jena is the common university of Altenburg and the other Saxon duchies. There is a gymnasium at Altenburg, a lyceum at Eisenberg, six town schools, besides several preparatory and Sunday schools, a seminary for schoolmasters, a school of design, another for arts and mechanics, a foundation for noble ladies, and some scientific associations.

The duke of Saxe-Altenburg is a member of the Germanic Confederation, and has one vote. By the new constitution of 29th April, 1831, the States, which assemble every four years, consist of three classes, but all the twelve delegates, under a president nominated by the duke, form only one chamber.

Altenburg, like all the country between the Saale and the Mulda, forms part of the antient Osterland, and appears from a very early period to have been under the margraves of Meissen. After numerous changes of masters, it was formed into a separate principality in 1603, when duke John of Weimar, grandson of John Frederic, the unfortunate elector of Saxony, divided the hereditary dominions with the son of his deceased brother, Frederic William I., to whom he gave Altenburg, while he himself retained Weimar. On the extinction of the house of Altenburg in 1672, the larger portion reverted to Ernest the Pious, duke of Gotha. From this period the principality of Altenburg was governed by the family of Saxe-Gotha, till it expired in the person of Frederic IV., in February, 1825. By the territorial compact among the three junior branches of the house of Gotha, viz. Meiningen, Hildburghausen, and Coburg, the duke of Hildburghausen, on the 15th November, 1826, resigned his own territories to Meiningen, and received in lieu the duchy of Altenburg, with the exception of the districts of Eisenberg and Kamburg. The only towns in this duchy with more than 4000 inhabitants are:—1, Altenburg, which has 13,763 inhabitants. 2, Ronneburg, a walled town, containing a ducal palace, two churches, and above 5000 inhabitants, who subsist by agriculture, mechanical trades, manufactures of woollen cloths, pottery, porcelain, and leather. Near the town there is a mineral spring which is much frequented. Black chalk for drawing is found in the neighbourhood. 3, Eisenburg, which is situated on a considerable eminence. It is surrounded with walls, has four gates, and a palace, which is generally the residence of the dowager-duchess. It has three churches, an observatory, a town-hall, a poorhouse, and 4465 inhabitants, who manufacture woollens, ribbons, leather, porcelain, household furniture, and carriages, with which they carry on a considerable trade. [ALTENBURG.]

SAXE-COBURG-GOTHA, a duchy in the southern part of Thuringia, is composed of two large and various smaller detached portions, which are surrounded by the territories of Prussia, Schwarzburg, Sonderhausen, Weimar, Electoral Hesse, Meiningen, and Bavaria. The principality of Coburg lies between 50° 8′ and 50° 23′ N. lat., and between 10° 49′ and 11° 14′ E. long., and that of Gotha between 50° 38′ and 51° 20′ N. lat., and between 10° 15′ and 11° 2′ E. long. The area of Coburg is about 200 square miles; that of Gotha about 590: making a total of about 790 square miles. The country, though occasionally level, especially in the south of Coburg, is on the whole of a mountainous character, more particularly in the south part of Gotha, which is traversed by a large portion of the Thuringian range, of which the loftiest points are, the Schneekopf, 3113 feet, the Inselberg, 2947 feet, and others of nearly equal elevation. This chain, extending in a south-easterly direction from Eisenach through Gotha to the frontiers of Reuss, where it receives the name of Frankenwald, is on the whole nearly 70 miles in length and from 4 to 6 in breadth. It runs nearly to the Saale, where it is divided by the valley of the Rodach from the Fichtelgebirge, and is for the most part covered with pine and fir. A little corn is cultivated, and there are some rich pasture-lands. This mountain-chain contains gold, silver, copper, and a large quantity of iron, lead, arsenic, and cobalt.

The rivers are tributaries of the Main, the Weser, and the Saale. The rivers of Coburg are the Itz, Steinach, Rodach, and Nasslach; those of Gotha, the Hörsel, with the Emse, Ruhl, and Nessa, the Unstrut, Gera, and Apfelstedt.

Agriculture is the principal occupation of the inhabitants, especially in the low lands, which yield abundance of corn, hops, vegetables, carrots for the making of sugar, flax, anise, carraway, poppy, and canary seed, and excellent fruit. The forests yield timber, potash, and pitch.

The rearing of cattle is prosecuted with much activity; the sheep are generally of the Merino breed, and the horses strong and of a good make; swine and poultry, particularly geese, are plentiful. Iron is found near Friederichsstadt; there are also coals, sandstone, millstones, marble, alabasters, gypsum, lime, potters'-clay, porcelain-earth, and salt. There is considerable manufacturing industry in Gotha, but little in the other districts; the chief articles are linen-yarn, ticking, twills, woollens, and cottons; tar and lamp-black; also manufactories of iron, steel, starch, tobacco, whitelead, soap, paper, porcelain, copper and iron utensils, and glass.

The exports are—from Gotha, timber, pine and other wood seeds, wool, coriander and anise seed, and oil, pitch, lampblack, peat, linen and cotton goods, metal and wooden wares; from Coburg, cattle, butter, linen, and wool. In addition to the exports, the duchy has a considerable transit trade, as the high road from Leipzig to Frankfort passes through it.

The population of Coburg is 41,000, and that of Gotha 96,658; making a total of 137,658, of whom 134,220 are Lutheran Protestants, 2238 Roman Catholics, and 1200 Jews. It contains 9 towns, 10 market-towns, 429 villages, and 23,950 houses.

Saxe-Coburg participates in the joint proprietorship of the University of Jena, and has 4 gymnasia, 2 institutions for schoolmasters, 1 for commerce, 4 for design and mechanics, besides several hundreds of town, village, and Sunday schools.

The principality of Coburg has had a representative constitution since 1821, composed of 17 delegates; Gotha has had its chamber of representatives from an early period, which differs in its nature and arrangement from that of Coburg.

Coburg formerly belonged to the counts of Henneberg, but came by marriage into the Ernestine branch of the house of Saxony. On the death of the unfortunate elector John Frederic, his territories were divided between his sons, and after the extinction of his house it reverted first to the princes of Altenburg, and upon their dissolution to Ernest the Pious, duke of Gotha, whose second son Albert inherited the principality of Coburg, while his seventh son John Ernest, who received some districts in the principality of Altenburg and Saalfeld, became the founder of the line of Coburg-Saalfeld, after very long and severe contests among the different ducal branches of the house of Gotha. His two sons, who reigned jointly, removed the seat of government to Coburg, and it was governed by their descendants till 1806, when Napoleon took possession of it, because Duke Ernest, who had just succeeded his father, was absent in the Russian service. He was reinstated at the peace of Tilsit, and as an acknowledgment for the active share he had taken in the liberation of Germany, he received, in 1816, a considerable accession of territory in the principality of Lichtenberg, with 20,000 inhabitants, which he however ceded to Prussia in 1834, in consideration of an annual rental of 80,000 dollars. On the territorial division of the duchy of Gotha-Altenburg, in 1825, Coburg resigned its possessions on the left bank of the Steinach in exchange for the principality of Gotha, with the exception of a few smal districts: it also obtained Königsberg and Sonnefeld from

Hildburghausen, and Kahlenberg and Gauerstadt from Meiningen.

The house of Gotha, properly so called, commenced in 1640. Upon the defeat of the famous elector John Frederic (who was of the Ernestine line) by Charles V. at the battle of Mühlberg, in 1547, the electoral dignity was transferred to the Albertine branch, and John Frederic afterwards received as a compensation various districts in Southern Thuringia. His son fixed his residence at Gotha, and his grandsons became the founders of the four houses of Coburg, Eisenach, Altenburg, and Weimar. On the extinction of the two first in 1640, their lands were divided among the surviving branches. Ernest the Pious received that portion in which Gotha was situated; he considerably augmented it by inheritance, and caused it to be erected into an independent principality by the German Diet. He promoted the welfare of his subjects, and restored order and tranquillity in his dominions, which had been desolated by the Thirty Years' War. He directed by will that his territories should continue undivided, and be governed jointly by his seven sons; but finding such an arrangement impracticable, they agreed to separate them, and formed seven distinct houses. The eldest son, Frederic I., had Gotha and other neighbouring districts as his portion, and to prevent a similar partition, he established the law of primogeniture. His successors were great promoters of the arts and sciences, and laid the foundation of many noble collections. On the death of the last lineal descendant, in February, 1825, the duchy of Gotha was divided among the dukes of Saxe-Meiningen, Hildburghausen, and Coburg, the last having as its share the principality of Gotha, but it still retains its antient and peculiar constitutional and political laws and customs. The only towns with more than 5000 inhabitants are, Coburg with 9076 and Gotha with 13,838 inhabitants.

SAXE-LAUENBURG. [LAUENBURG.]

SAXE-MEININGEN-HILDBURGHAUSEN, a duchy composed of the antient duchy of Meiningen, the principalities of Hildburghausen and Saalfeld, the districts Themar, Römhild, Kranichfeld, and Kamburg, with seven villages from Coburg, which (with the exception of the newly acquired districts from Gotha and Altenburg) form one compact territory, extending in a semicircle along the banks of the Werra, and skirted by the chain of the Thuringian Forest. It lies between 50° 13′ and 50° 58′ N. lat. and 9° 57′ and 11° 54′ E. long., and has an area of nearly 882 square miles, of which Hildburghausen occupies 194 and Saalfeld 171 square miles, and it is enclosed by the territories of Bavaria, Coburg, Reuss, Weimar, Schwarzburg, Electoral Hesse, Gotha, and Eisenach. Being situated between the Thuringian and Fichtel chains, the character of the surface is mountainous: the loftiest points are the Bletzberg, 2760 feet high, the Kieferle, 2598, the Gerberstein, 2184, the Geba, Dolmar, &c. of nearly equal elevation. Their valleys supply rich pasturage to numerous flocks and herds; they also contain many curious caverns, of which the most remarkable are the Zinselloch, the Griebisch, and the Altensteinerhöhe.

The principal rivers are, the Werra, which, with many tributaries, traverses the whole duchy; the Saale, Itz, Rodach, Milz, and Steinach; the vales of some of these rivers are very picturesque. There are mineral springs near Liebenstein and Salzungen, and salt springs near Friedrichshall and Neusulza. Notwithstanding its limited extent, there is a marked difference in the climate of the high and low lands; in the former, which is one complete mass of mountains, the winter is very severe, while in the latter it is mild. The productions are those of central Germany—grain of all kinds, fruits, vegetables, rapeseed, tobacco, timber, which is the staple of the country, game, fish, poultry, and honey. Among its mineral products are freestone and sandstone, slate, marble, porcelain and potters'-clay, bole, fullers'-earth, flint, gold sand from the Werra, copper, lead, iron, sulphur, cobalt, salt, coals, pitch, tar, lampblack, vitriol, alum, and basalt.

Agriculture is the most important branch of industry, though some of the districts do not raise sufficient corn for their own consumption; fruit is cultivated to a great extent; cattle and sheep of the improved breeds are reared in all the districts; there are also large flocks of goats.

There is considerable manufacturing industry, particularly in the highlands and in the principality of Saalfeld, where there are many furnaces, works, mills, and glass-houses. The ordinary manufactures are coarse linens, sail-cloth, woollens, and cottons; there [illegible] breweries, and tan-yards. The exp [illegible] above 1000 floats are annually sent by [illegible] den, sheep, horned cattle, tobacco, wool, [illegible] yarn, pitch, potash, tar, Sonnenburg toys, [illegible] trade is carried on, woollens, glass, porcelain, [illegible]

The University of Jena, being founded [illegible] of the states of the Ernestine line, is open to [illegible] which also possesses a share in the mutual g[illegible] Schleusingen, besides having a gymnasi[illegible] and Hildburghausen. There is a gran[illegible] feld, one school for teachers, one for [illegible] above 200 town and village schools.

The population of the duchy and its de[illegible] 144,294, of whom 140,200 are of t[illegible] religion, 394 of the Reformed, 45[illegible] 1030 Jews. It contains 23 towns, 1[illegible] towns [illegible] fairs, and 431 villages. The principal towns are— [illegible] with 6000 inhabitants; Saalfeld, 4300; Hild[illegible] 3500; Pösneck, 3500; Sonneberg, 3480; and [illegible]

The duchy of Saxe-Meiningen formerly [illegible] of the domains of the counts of Henneb[illegible] passed by marriage to the house of Saxony, [illegible] various territorial divisions, into the possession [illegible] Pious, duke of Gotha. On the division of his [illegible] nions among his seven sons, Bernhard, his third [illegible] the founder of the line of Meiningen in 16[illegible] sons reigned jointly, a custom which continued [illegible] till the time of Duke George, who, on the [illegible] brother, introduced the law of primogeniture in 18[illegible]. He was succeeded in 1803 by his infant son Duke Bernhard, who, under the guardianship of his mother, joined the Confederation of the Rhine in 1806, and the allies in 1813. Duke Bernhard has introduced many salutary reforms in the civil and judicial administration. On the extinction of the house of Saxe-Gotha-Altenburg, in 1826, Meiningen received a considerable accession of territory in the principalities of Hildburghausen and Saalfeld, seven villages of Neustadt, also Themar, part of Römhild, Kamburg, [illegible]berg, and Kranichfeld, with the exception of some minor districts, giving up at the same time Kahlenberg and Gauerstadt.

Hildburghausen was founded by Ernest, sixth son of Ernest the Pious, in whose family it continued till 1826, when, by a family compact among the junior ducal houses, the reigning duke Frederic exchanged it for the duchy of Altenburg; since this period it has merged into the duchy of Meiningen, with the exception of a few districts which were ceded to Coburg.

SAXE-WEIMAR-EISENACH, a grand-duchy on the northern frontiers of the Thuringian Forest, consists of the two principalities of Weimar and Eisenach, which are separated by Saxe-Gotha, and of the insulated district of Neustadt, besides various detached portions. Weimar lies along the banks of the Saale, and Eisenach on those of the Werra near the Thuringian and Rhön mountains. It extends from 50° 25′ to 51° 27′ N. lat. and 9° 53′ to 12° 18′ E. long., over an area of about 1404 square miles (of which Weimar occupies about 966 and Eisenach 445), and is bounded on the north and north-east by Prussian Saxony, east and south-east by Altenburg and Reuss, and south and west by portions of Schwarzburg, Coburg-Gotha, Meiningen, Bavaria, and Electoral Hesse.

Except in the district of Neustadt, the soil is rich and well adapted to agriculture, wherever the gently undulating hills do not rise into mountain-ridges, but the most elevated point, the Gikkelhahn near Ilmenau, does not attain a height of more than 2700 feet. The climate of the mountain-region is very bleak, but the valleys and the level districts are mild and agreeable.

The principal rivers are,—the Saale, Ilm, Elster Orla, Unstrut, and Gera, in Weimar, and the Werra, Hörsel, Nessa, Ulster, and Felda in Eisenach, which are all tributaries of the Elbe and Weser. There are mineral springs near Berka and Ruhla.

There is a considerable diversity in the three districts of Weimar, Eisenach, and Neustadt. Weimar is entirely agricultural, and in favourable years raises more corn than is required for home consumption; though Neustadt grows a good deal of grain, yet in bad seasons it is liable to scarcity; Eisenach, which is extremely mountainous, is dependent for food either upon the other districts or else upon its own abundant crops of potatoes.

The chief productions are wool, which is the staple article of commerce, grain of all kinds, vegetables, fruit, flax, hemp, rapeseed, hops, a small quantity of wine, pitch, tar, and lampblack. The mineral productions, which are very sparingly wrought, are manganese, alabaster, gypsum, porcelain and potters' clay, basalt, sandstone and freestone, iron, and salt. Peat is also dug in some parts of the country. The rearing of cattle forms an important branch of industry; the horned cattle are mostly reared in Neustadt; and sheep of an improved breed in Weimar.

Manufactures make little progress; Eisenach possesses the greatest number, such as woollens, coarse linens, and stockings; there are a few potteries, porcelain manufactories, and paper-mills. The exports are wool, woollen, linen and cotton goods, stockings, hats, pottery, potash, ironware, dried fruits, juniper berries, and game.

The population of Saxe-Weimar-Eisenach, in 1838, was 245,813, of whom 227,398 belonged to the established Lutheran church, 6679 to the Reformed, 10,330 to the Roman Catholic, and 1406 to the Jewish persuasion. It is now 248,498, of whom 174,937 live in the country, and 73,561 in the 33 towns, the principal of which are WEIMAR, with 11,485 inhabitants; EISENACH, with 9340; JENA, with 6004; and APOLDA, with 4236 inhabitants. There is a university at Jena with 433 students, two gymnasia, three upper schools, and above 500 town and village schools; two institutions for training schoolmasters, one blind and one deaf and dumb asylum, a school for forest economy, free schools of industry, &c., besides many literary and scientific institutions. The court of Weimar has long been celebrated for its liberal encouragement of the fine arts, which has diffused a cultivated taste among the natives of Weimar, and attracted the most eminent literary characters of Germany, among whom were Herder, Wieland, Schiller, Göthe, and others.

The frequent subdivisions of the Ernestine ducal Saxon houses render their history extremity intricate. Like all its cognate branches, the line of Weimar boasts its descent from the illustrious John Frederic of Saxony, who, on being deprived by Charles V. of his electoral dignity and dominions, had certain territories assigned to him in Thuringia. The founder of the house of Weimar is John, who was born in 1570, and whose original patrimony has been considerably augmented by purchase and the extinction of some of the collateral branches. His sons took a very prominent part in the Thirty Years' War, and the name of Bernhard of Weimar is inseparably interwoven with its history. Duke Ernest Augustus, in order to secure the integrity of his dominions, introduced the law of primogeniture, which was confirmed by the emperor in 1724; in 1741 he inherited Eisenach and Jena, on the death of Duke William Henry of Saxe-Eisenach without male issue. He died in 1748, leaving his son a minor. This son, dying in 1758, left an infant son Charles Augustus under the guardianship of his widow, Anna Amelia of Brunswick, a princess of distinguished talents, which she devoted to the advancement of the general interests of her states, and laid the foundations of the literary celebrity of Weimar. Charles Augustus, following the example of his mother, made his dominions the centre of German arts and sciences. He took an active share in the wars of Prussia against France, but after the unfortunate battle of Jena was compelled to join the Confederation of the Rhine in 1806; on the victory of Leipzig however he united himself to the allies and undertook the command of an army in the Netherlands. At the Congress of Vienna, he received an accession of territory with 77,000 subjects, and the dignity of grand-duke, which gives him claim to the title of royal highness. In 1816 he gave his people a representative constitution, and secured their affection by his paternal administration. He was succeeded in 1828 by his son Charles Frederic. [APOLDA; EISENACH; JENA; WEIMAR.]

SAXE-WEIMAR, BERNHARD, DUKE OF, born at Weimar, Aug. 16, 1600, was the fourth of the seven sons of John, duke of Saxe-Weimar. As all the important circumstances of his life are connected with the Thirty Years' War in Germany, the detail of them will be most clearly understood when viewed in connection with the other leading events of that great contest. [THIRTY YEARS' WAR.] We shall only give here a brief statement of the leading facts of his career, with the addition of the sketch of his character drawn by Schiller

After the battle of Prague, Nov 3 1620, Bernhard served in the army raised by the margrave of Baden-Durlach for the purpose of assisting Frederick V., king of Bohemia and elector palatine, to support himself after the loss sustained in that disastrous affair. In 1623 he commanded a regiment of infantry in the army of Duke Christian of Brunswick; and in 1625, and again in 1627, he was placed at the head of a regiment of cavalry in the Danish army raised by Christian IV. in support of the Protestant union. After the alliance between Louis XIII. and Gustavus Adolphus, Jan. 13, 1631, he joined the latter, who promised him the bishoprics of Bamberg and Würzburg, with the title of duke of Franconia. Bernhard distinguished himself at the siege of Würzburg, in forcing the passage of Oppenheim, and in the Palatinate, where he took Mannheim by stratagem, and forced the enemy from all his posts in that quarter. Gustavus afterwards appointed him to the command of an army designed for the conquest of Bavaria, with which he advanced as far as the mountains of the Tyrol, obtained possession of the three fortresses of Ehrenburg, the keys of that country, and put the emperor in fear for his Italian states. Gustavus however recalled Bernhard to assist him against Wallenstein, and shortly afterwards they fought together at the battle of Lützen, Nov. 16, 1632; and when Gustavus fell, the duke of Weimar took the command, and forced the enemy to retreat, and shortly afterwards drove the Imperial army out of Saxony. The Swedish army was afterwards divided into two parts by the chancellor Oxenstierna, and placed under the command of Marshal Horn and Bernhard of Weimar. Bernhard besieged and took Ratisbon, which however was afterwards retaken by the Imperial army, July 29, 1634, and Bernhard and Horn were afterwards defeated at Nordlingen, Sept. 7, 1634, owing to the impatience of the duke of Weimar to give battle without waiting for the arrival of reinforcements. On the 6th of October, 1635, Bernhard concluded a treaty of alliance and subsidy with the king of France. He was occupied for a considerable time in a series of less important affairs, and in quelling the mutinous spirit of the German armies, by procuring, through the agency of Oxenstierna, a portion at least of the arrears of pay. On the 3rd of March, 1638, he gained the great victory of Rheinfelden, and obtained possession of the fortress on the 22nd of March. He afterwards besieged Alt Breisach, then considered one of the strongest places in Europe, which capitulated Dec. 19, 1638. He died suddenly at Neuburg on the Rhine, of a pestilential fever, July 18, 1639.

'The duke of Weimar imitated,' says Schiller, 'the lofty example of Gustavus Adolphus, in whose school he was trained, and only required a longer life to have reached it, perhaps to have surpassed it. To the personal bravery of the soldier he joined the cool and steady eye of the general; to the courageous endurance of manhood, the rapid decision of youth; to the fiery impetuosity of the warrior, the dignity of the prince, the moderation of the wise man, and the delicacy of the man of honour. Unsubdued by misfortune, he sprung up after the most severe blow with undiminished promptitude and energy. No impediment could check his daring spirit, no failure could damp his invincible courage. His aims were lofty, perhaps higher than he could have reached; but men of his character are not subject to the ordinary laws of prudence by which the mass of mankind is governed. Capable of accomplishing more than others, their plans are sketched with a boldness bordering on audacity. Bernhard of Weimar stands in modern history as a fine specimen of those vigorous times when personal greatness was the highest title to honour, when valour won kingdoms, and the virtues of a hero raised a German knight to the Imperial throne.'

(*Biographie Universelle*; Schiller's *Geschichte des Dreyssigjährigen Kriegs*.) [GUSTAVUS ADOLPHUS; OXENSTIERNA; WALLENSTEIN.]

SAXI'CAVA. [LITHOPHAGIDÆ, vol. xiv., p. 50.]

SAXI'COLA, the scientific generic name for the *Stonechats*. [WARBLERS.]

SAXICOLI'NÆ. [WARBLERS.]

SAX'IFRAGA (from *saxum* and *frango*, in allusion to their supposed medical virtues), a genus of plants, the type of the natural order Saxifragaceæ. It is characterised by possessing a calyx, either free or partly united to the ovary, and divided into 5 segments; a corolla consisting of 5 petals; 10 stamens, with awl-shaped filaments and roundish anthers; pistils having two styles with obtuse stigmas; a capsule with 2 beaks, 2-celled, many-seeded, opening between the beaks; the seeds upon a receptacle attached to the dissepiment.

The species of this genus have been a source of as much difficulty to botanists, as those of Rosa, Rubus, and Salix; and although much has been done lately towards the identification of species and varieties, much yet remains to be effected. DeCandolle enumerates 150 species, whilst D. Don, who has paid great attention to this genus, and has written a valuable monograph on it, published in the 13th volume of the 'Linnæan Transactions,' makes only 110 species. Of these 24 are British. They are mostly inhabitants of alpine and subalpine regions of the colder and temperate parts of the northern zone. They are most of them true rock plants, and send forth their roots between the crevices of rocks on which they grow, by which means they loosen fragments of the rock, and in this way their name applies to them much better than to their supposed influence over calculus in the human system. Many of these species are well known as ornamental plants in our gardens, for which their hardy habits and beautiful flowers well adapt them. The numerous species are grouped by most botanists in various sections, whilst some have split the genus Saxifraga into many independent genera. In this place we shall only give a few examples of the species.

Saxifraga umbrosa, London-pride, or None-so-pretty: calyx reflexed; leaves undivided, obovate with sharp cartilaginous teeth, tapering gradually into a broad foot-stalk which varies in length; scape from 9 to 18 inches high, erect, panicled, red and hairy, with a few small scattered entire bracts; flowers numerous, with obtuse petals, white or flesh-coloured, beautifully spotted with yellow near the base, and dark red towards the extremity; capsule superior, purplish. This plant was found by Tournefort on the hills of Spain, and is a native of Great Britain and Ireland. It is one of the most popular of garden flowers, blossoming in April and June, and attaining perfection even amidst the smoke of London. In Ireland it is known by the name of St. Patrick's cabbage.

S. Gemu, Kidney-leaved Saxifrage: calyx reflexed; leaves undivided, roundish, kidney-shaped, sharply toothed, more or less hairy: footstalks linear, channelled; scape panicled, capsules superior. This species is found on mountains in the South of Ireland, and is considered by some botanists as only a variety of the former.

There is another species, the *S. hirsuta*, Hairy oval-leaved Saxifrage, with characters between the other two; the leaves are oval and heart-shaped, and the whole plant is hairy. With the two last, it is found in Ireland, on the Pyrenees, and the Southern Alps of Germany and Switzerland.

S. Granulata, White or Granulated Meadow Saxifrage: calyx spreading; radical leaves, kidney-shaped, on long foot-stalks, obtusely lobed, those of the upper part of the stem nearly sessile, acutely lobed; stem panicled, root consisting of numerous small clustered tubers. This plant is found in Great Britain, and, though not common, is abundant on gravelly soils. The roots of this species, forming as they do little granular masses, were at one time sold in the shops under the name of saxifrage seed. It was formerly used extensively in nephritic and urinary diseases, but as its use arose out of the exploded doctrine of 'signatures,' by which it was supposed that every plant by the form or character of some part indicated the disease for which it might be employed, and as its power of relieving disease has never been satisfactorily observed, it is now deservedly falling into disuse. The purpose which these little knobs seem to serve in the economy of the plant is that of supplying nutriment to the stem and other parts during seasons of drought: and this is rendered more probable by the fact of these bodies being found larger at the commencement of a dry season. Several varieties of this pretty saxifrage are frequently found in gardens.

S. Aizoon, Aizoon or Marginated Saxifrage: leaves undivided, radical ones aggregated, tongue-shaped, silvery, with sharp cartilaginous serratures; flowers corymbose; calyx naked and smooth, with acute segments; petals nearly orbicular. This plant is a native of Alpine situations in Austria, Switzerland, and most countries of the continent of Europe. It is frequent in gardens, bearing flowers with cream coloured petals and reddish dots, opening in June and July. It is perennial and perfectly hardy.

S. cotyledon, Pyramidal Saxifrage: leaves ligulate, obtuse, cartilaginously serrated; calyx densely beset with glands with linear, lanceolate, obtuse segments; petals oblong three-ribbed, of a pure white [illegible] native of the mountains of Lapland, [illegible] zerland, and the Pyrenees. It is co[illegible] is well known for the profusion of [illegible] produces, which appear early in the [illegible] several varieties of this plant found in gardens [illegible] remarkable for their pyramid of snow-[illegible] These will continue for some time, provided [illegible] kept in the shade, and well screened from the the wind and rain.

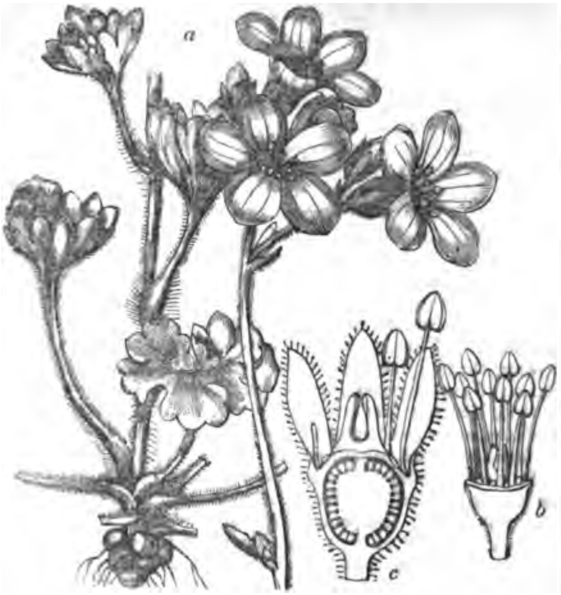
S. hypnoides, Mossy Saxifrage, or Ladies' [illegible] spreading; leaves lobed, radical ones [illegible] those of the procumbent shoot undivi[illegible] bristle-pointed, and more or less fri[illegible] calyx ovate, pointed, petals round[illegible] three-ribbed, with or without lateral veins [illegible] quent plant in mountainous situations of [illegible] especially among limestone rocks. It is also [illegible] mountains of Norway and on the Pyrenees. It is frequently found in gardens, where it thrives on shady walls and amongst rock-work. Several varieties of this species have been described, some of which have been elevated into species. An excellent description of the varieties of the and other British species will be found in Hooker's 'British Flora.' In planting, this species is easily increased, by means of its trailing branches, which being placed in moist earth, in a shady situation in autumn, will put forth shoots in the following spring.

S. crassifolia, Thick-leaved Saxifrage: leaves undivided, coriaceous, roundish-oval, abrupt, stalked, serrated, smooth; scape naked; panicle dense, cymose. This plant, although now one of the most common in our gardens, is a native of the mountains of Siberia. It is said to have been first introduced into this country in 1765, by Dr. Solander. It flowers early in March and April, and the great size of the plant and its thick large coriaceous leaves distinguish it from the other species. The flowers are abundant, and of a light purple colour. This plant may be easily propagated in gardens by parting the roots, and planting them out separate, in the spring or autumn, in open ground or in pots.

S. sarmentosa, Chinese Saxifrage: leaves undivided, roundish, toothed, hairy; petals, two of them elongated. This species is a native of China and Japan, and is frequently found growing on rock-work and in shady places in our gardens. It is remarkable for its trailing stems, which it spreads round like a young strawberry plant, which taking root in the ground, produces young plants in great abundance. The irregularity of the flower of this species has induced some botanists to place it in a new genus, but it is still most generally referred to under its original name. It may be readily raised from the runners which it gives off, which may be planted in pots, and placed in the green-house, although in mild winters they will grow in the open air in sheltered situations.

SAXIFRAGA'CEÆ, a natural order of plants belonging to the apocarpous group of polypetalous Exogens. It consists of shrubs and herbaceous plants with single alternate leaves without stipules. The calyx consists of five sepals more or less united at the base. The petals are equal in number to the lobes of the calyx, and alternate with them. The stamens are perigynous, 5-10 in number; anthers two-celled. They have an hypogynous or perigynous disk. The ovary is inferior, or nearly superior, consisting of two carpels which cohere more or less by their face at the base, but diverge at the apex; one- or two-celled, with a parietal or central placenta. They have no styles, and the stigma is sessile on the tops of the lobes of the ovary. The seeds are numerous, very minute; the embryo is taper, lying in the axis of fleshy albumen. The genus Parnassia belonging to this order differs in having four parietal placentæ, which are opposite the lobes of the stigma. The genus Heuchera has irregular flowers and stipules.

This order is most nearly allied to Rosaceæ, but it differs in its many-seeded partially-united carpels, its albuminous seeds, and in its not possessing stipules. The habit of Saxifragaceæ allies them to Caryophylleæ, but they differ in the character of their placentæ, the situation of the embryo, and other points. This order also approaches Crassulaceæ, but Saxifragaceæ are distinguished by possessing a less number of carpels, and by the absence of glands at the base of the carpels. They are for the most part mountain plants, chiefly remarkable for the delicacy and beauty of their flowers, which are usually white



Saxifraga granulata.

a, entire plant; *b*, calyx cohering to the carpels, with perigynous stamens; *c*, longitudinal section of flower, showing the half superior ovary and ovules attached to central placentæ, with the relation of the stamens to the petals.

They inhabit the mountainous districts of Europe and the northern parts of the world, and constitute the chief beauty of the vegetation in high Alpine stations.

The whole order is represented by De Candolle as possessing astringent properties. The Heuchera Americana is remarkable for its powerful astringency, and is used in medicine under the name of the North American alum root. Chrysopleium is reputed to possess both aperient and diuretic properties; but these cannot be very powerful, as it is used in the Vosges as a salad, under the name of *Cresson de Roché*.

SAXO, with whose name is commonly found the addition of GRAMMATICUS, the Grammarian, or the Learned Man, was a Dane of the twelfth century, and the author of a history of that nation, which is regarded as the best authority on the subject. This work was prepared at the suggest on of his patron Absalom, archbishop of Lunden. It ends with the year 1186. It is written in Latin, in a somewhat florid style, and, for the later years, is a most authentic and valuable historical remain; but the earlier portions are supposed to be of less certain authority.

There is an edition in folio, Paris, 1514, with the title Historia Regum Heroumque Danorum;' and another by one of the Stephens', with prolegomena, in which what little is known concerning him is to be found.

The name of Saxo-Grammaticus is connected with English literature as being the author who first gives the history of King Hamlet.

SAXON ARCHITECTURE. [GOTHIC ARCHITECTURE.]

SAXON LANGUAGE AND LITERATURE. The terms Saxon and Anglo-Saxon are popularly used to designate that dialect of our language which prevailed to the close of the twelfth century. The use of these terms is however comparatively modern, and the men who spoke this dialect always called it the English. Several of our MS. chronicles begin thus:—'Britain island is eight hundred miles long, and two hundred miles broad. And there are in the island five languages, *Ænglish*, and Brit-Welsh, and Scottish, and Pightish, and Book-Latin,' &c. Still we may use these terms with some convenience, and (thus cautioned) without any danger of being misled. We proceed to point out the peculiarities which distinguish the Anglo-Saxon from the succeeding dialects of our language.

The Anglo-Saxon, like the Latin and the Greek, often distinguished the cases of its noun, and the conjugations, numbers, and persons of its verb, by a change in the vowel of the final syllable; in the dialect which succeeded, and which has been called the Old English, all these vowels were confounded, and in our modern dialect they have, for the most part, been lost. Thus the Anglo-Saxon *ath* has *athas* in the nominative and accusative plural, and *athes* in the genitive singular; the Old English *oth* has *othes* not only for its genitive singular, but also for its nominative and accusative plural; and in our modern English these three cases are all represented by the monosyllable *oaths*. Again, in the Anglo-Saxon, *athe* was the dative singular, and *atha* the genitive plural; in the Old English, *othe* represented both dative singular and genitive plural; and our present dialect, having lost the final vowel, had no means left of distinguishing these cases from the nominative *oath*. The third person singular of *lufian* was *lufath*, and the first, second, and third persons plural *lufiath*; in the Old English, *loveth* represented both numbers, and *lov'th* is the third person singular in the *spoken* language of the present day.

We say 'spoken language,' because our *grammarians* make *eth* the ending of the third person singular. But in Somersetshire, west of the Parret, where the southern dialect still lingers, they uniformly say *he lov'th, he read'th, he zee'th, it rain'th*, &c. (Jennings, *Obs. on the West. Dial.*) We have very satisfactory evidence, that in the sixteenth and seventeenth centuries this dialect was general throughout the south of England, and we find numerous traces of its peculiarities in the literature of that period. Dolman wrote the following passage, in the sixteenth century:—

> 'So, mid the vale, the greyhound seeing stert
> His fearful foe *pursu'th*, before she *flert'th*,
> And where she *turn'th*, he *turn'th* her there to beare,
> The one prey *prick'th*, the other safeties feare.'
> *Mirr. for Mag.* Hastings.

Spenser has *melt'th* and *hat'th*, and Sackville *leap'th*. It is probable, that the inflexion used by the translators of the Bible, and which is found in other contemporary works, was merely an old form, taken from the language of books, and adopted chiefly with the view of raising the style. The same observation will apply to *est*, the inflexion of the second person singular, and to some other endings, which are still preserved entire in our grammars, though they have lost their vowel in the spoken language, for the last two centuries.

It is obvious, that either of the changes above noticed must have brought with it a new language. When, in the twelfth century, the vowels of the final syllables were confounded, there was at the same time a confusion of case and number, of tense and person,—in short, of those grammatical forms to which language owes its precision and its clearness. A writer had to seek for new forms of expression before he could convey his meaning clearly. As he had lost the means of distinguishing several cases of his noun, he called in the prepositions to his aid, and to show more clearly the 'regimen' of his sentence, was obliged to confine within very narrow limits the position of his verb,—thus abandoning all that freedom of transposition, which is almost as remarkable in the Anglo-Saxon as in the Greek and Latin. The confusion introduced into his conjugations and tenses, he sought to remedy by various devices, which have hitherto been very little investigated, and at last he had recourse to that general use of the auxiliary verbs, which is at present so marked a feature in the language. The new dialect which resulted from these changes kept its ground for nearly two centuries. It exhibits the most striking analogies with the contemporary dialects of Germany and the Netherlands, and the further changes which converted it into our modern English were rapidly working a like revolution in these sister-tongues, when the invention of printing doubled the influence of their written language, and thus preserved them from further corruption. Unfortunately, at the time of this discovery, the vowels of our final syllables had already given way; the inflexions of our noun were gradually reduced to the miserable remnant which our grammars still recognise; our adjectives, singular and plural, definite and indefinite, were all confounded; the past tense in *ede* could no longer be distinguished from the participle in *ed*, and our modern English was the result,—a language, according to some critics, flexible yet precise, copious yet methodical, enriched from all languages, yet possessing a noble simplicity of structure; according to others, broken and inconsistent, vague and fluctuating, neither possessing a sufficiency of terms, nor provided with laws and analogies by which they can be invented.

In tracing the causes which melted down the Anglo-Saxon into the Old-English, we have not once alluded to the influences supposed to have been exercised by the French language. The popular notions on this subject are, we believe, most erroneous. Had Harold been the conqueror at Hastings, the Anglo-Saxon must have perished, just as the Old-German perished in Germany, and the Old-

Norse in Denmark. The victory of William merely hastened by a few years an event that was inevitable. The use of Norman-Romance as the court language of England rendered unfashionable a literature already too weak to stem those changes to which the language of a busy adventurous people is peculiarly liable; and thus far the Norman conquest may be considered as having assisted in the destruction of the Anglo-Saxon. But the vulgar notion, that it produced a mixed language, a jargon composed half of English and half of French, is wholly at variance with the MS. literature of that period. The Ormulum, in which all the peculiar features of the Old-English are developed, and not a trace of the Anglo-Saxon can be found, is almost as free from *Gallicisms* as any of our MSS. written before the Norman-French existed. The same may be said of most of the Old-English MSS. of the thirteenth century, and it is not till we approach the latter half of the fourteenth century that we find those 'cart-loads' of French words poured into the language, of which Skinner complains so loudly. We must reluctantly agree with this writer, in charging upon Chaucer much of the mischief resulting from these importations, not that he first introduced, but that his authority chiefly sanctioned them. The learned but pedantic writers of the Elizabethan æra, and, at a later period, Johnson, followed his example. They have 'enriched' our language with the spoils of the foreigner, till its vitality has been almost extinguished —till its native forms and analogies have grown so nearly obsolete, as to be almost unavailable to the production of a new term, or to the modification of those which have been so lavishly poured into it.

Having noticed the changes which converted the Anglo-Saxon into the Old-English, we will now call the reader's attention to a subject of rather difficult inquiry—its local dialects. It is abundantly clear that the Romans looked upon all the Gothic races as forming but one people, and as speaking the same language; but a comparison of the Anglo-Saxon with the Maeso-Gothic, as well as the analogy of other languages, may convince us that even thus early there were dialects, and these dialects have now been acted upon by various influences for nearly 2000 years, till they have at last arranged themselves into four great families—the Northern, the English, the Low-Dutch, and the High-Dutch. Now we have ample proof that the *Sexe* came from the south-western corner of the Cimbric Chersonesus, and that they were only separated by the Elbe from the Netherlands, or flat alluvial country, where the Low-Dutch was spoken. We know also that the Engle came from the eastern coast, and that they were separated from the Danish islands merely by a narrow arm of the sea. We might then expect that in the counties colonised by the Engle we should find many peculiarities of the Northern languages, and in the counties colonised by the Sexe much that reminded us of the Netherlandish or Low-Dutch. We believe the Northern and Southern dialects of our island have been at all times distinguished by such peculiarities, but so few early records have come down to us written in the pure dialect of our northern counties, that it is only by comparing them in the second or Old-English stage of their progress that we can form any just notion of their distinguishing features. Perhaps these are best seen in the conjugation of the verb. The following table may show us how closely the inflexions which distinguish our northern dialect agree with those of a Swedish conjugation:—

	South Dialect.		*North Dialect.*		*Swedish.*	
Pres.,	Ich	hop-e	I	hop-es	jag	hopp-as
„	thu	hop-est	thu	hop-es	du	hopp-as
„	he	hop-eth	he	hop-es	han	hopp-as
„	we	hop eth	we	hop-es	vi	hopp-as
„	ye	hop-eth	ye	hop-es	I	hopp-ens
„	they	hop-eth	they	hop-es	de	hopp-as
Perf,	thu	hoped-est	thu	hoped-es	du	hoppad-es
Imper.,		hop-eth ye		hop-es ye		
Infin.,		to hop-en		to hop-e		att hopp-as

The inflexions in *s* are generally used in the Northern languages with a passive meaning; and there are some traces of their having been used in our Northern dialect for the same purpose.

Another peculiarity of our Northern dialect is the frequent use of the substantival ending *er* (in which it again resembles the languages of Northern Europe), as *wulfer*, a wolf; *hunker*, a haunch; *teamer*, a team; *heather*, heath; *fletcher*, a fletch, &c.

In this dialect we have also a less frequent use of the articles, conjunctions, and personal pronouns. This is one of its most striking features. Every person who has been in the North of England must have heard such phrases as 'come out o house,' 'gang into field,' 'put'n in poke,' &c.

All these peculiarities of our North[illegible] dialect [illegible] traced to the Anglo-Saxon period; and [illegible] is [illegible] that the most striking feature of the [illegible] namely, its preference of the vocal to the [illegible] as *z* for *s*, and *v* for *f*, is equally antient [illegible] prevailed in the Netherlandish dialects, and may be [illegible] in the orthography of our Southern manuscripts to [illegible]ginning of the thirteenth century; but, as the [illegible] Saxons had neither a *v* nor a *z*, it is only by a[illegible] infer the existence of the corresponding sounds [illegible] language. The argument however from analogy [illegible] strong, that we may safely conclude either that the [illegible] Saxon *f*, *s* were pronounced in our southern coun[illegible] or that, like the modern *s*, they represented be[illegible] and a vocal sound; in other words, were pro[illegible] times as *f*, *s*, and sometimes as *v*, *z*.

It may possibly be asked, were not the f[illegible] here [illegible]buted to our Northern dialect introduced [illegible] they not, in fact, the peculiar features of [illegible] We will not affect to treat these que[illegible] without difficulty; but there are some c[illegible] may be laid concisely before the reader, [illegible] appear to him as forcible as they appear to [illegible] him to answer these questions in the negative.

In the first place, it must be remembered, that if no Dane had ever set foot on the island, the very results which *have* taken place might have been expected. It is also an argument of weight, that we find all the great features of our Northern dialect in places where there never was a Danish settlement, and vainly search for them, or at best only faintly trace them, in counties where we have historical evidence that the Northmen were numerous. But the strongest argument may be drawn from the pages of our Northern manuscripts. We have two of very antient date —the Gloss of the Durham Bible, written by a priest named Aldred, and the Durham Ritual, lately published by the Surtees Society. The first of these was written, according to Wanley, in the age of Alfred, and the second has been assigned by its editor to the early part of the ninth century. If we can rely on the judgment of either of these antiquaries, the question seems to be answered; for there was no Danish settlement in the north of England till a later period; and we have the Northern conjugation and other peculiarities of the Northern dialect in every page of the Gloss, and in many parts of the Ritual. The name too of Aldred is thoroughly English; and we can hardly suppose that the monks of Durham would have permitted a rude and unlettered foreigner to interpolate their most precious manuscript—a volume which we know they regarded with even superstitious veneration. The language used by Aldred was probably a mixture of the written language of the day and the spoken dialect of his shire, such as might be used by a provincial writer of the present day, and such as was avowedly used by Gawin Douglas in the fifteenth century, and at a later period by Burns.

This mixture of the written and the spoken language in our manuscripts, and the total extinction in many counties of our local dialects, render it extremely difficult to point out the limits within which our two great dialects were spoken. Layamon, whose language seems clearly to belong to the Southern dialect, is described in all the histories of our poetry as a native of South Gloucestershire; but the localities mentioned in his poem belong to the north of Worcestershire; and he was, beyond doubt, an inhabitant of Areley-Regis near Stourport in that county.* If he used the dialect of the neighbourhood (and this must be assumed till the contrary be shown), the Southern dialect must have prevailed over the whole of Worcestershire, and the men of that shire must have been Sexe in origin, and not, as hitherto supposed, a colony of Engle. Perhaps a line drawn from the north of Essex to the north of Worcestershire would pretty accurately define the portions of island respectively colonised by the Engle and the [illegible]

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* Hallam, in the corrigenda to his late work on the literature of the sixteenth century, has adopted this view, and by its aid corrected a misstatement in one of his earlier published volumes. He states however that Areley is 'near Bewdley in Worcestershire, but is itself in the county of Stafford.' He has mistaken Areley-Regis for Over-Areley.

The origin of the Midland dialect may admit of the following explanation. Neither natural obstacles nor political divisions ever separated the Northern and the Southern dialects. During the heptarchy, Gloucestershire and Oxfordshire belonged to Mercia, and not to the kindred race of the West-Sexe; and when the Danes held possession of the north of England, the shires of Warwick and Northampton, and generally that of Leicester also, were united in the closest ties with the southern counties. This fellowship seems to have led, at a very early period, to the use of an intermediate dialect, which would naturally be encouraged by the vast numbers that flocked from all parts of the country to the universities. The 'Reve's Tale' affords us a specimen of the ridicule which attached to the forms of Northern speech, and we know that the speech of the Southron was treated with just as little ceremony in the north of England. (See *Towneley Mysteries*, Secunda Past.) Hence we may understand the progress made by the intermediate dialect, and are prepared for the conclusion, to which we are led by an examination of our Old-English manuscripts, no less than by the express declaration of a contemporary philologist. Higden, who lived in the fourteenth century, ranges our provincial dialects under three heads, the Northern, the Midland, and the Southern; and this division seems to have been generally recognised by our antiquaries, for in our catalogues we find some manuscripts noticed as belonging to our Southern dialect, others as belonging to the Northern, while many of them, exhibiting the marked peculiarities of neither dialect, are passed over without remark.

The change which gradually produced the Midland dialect most probably first showed itself in the counties of Northampton, Warwick, and Leicester. It seems to have been brought about not so much by adopting the peculiarities of Southern speech, as by giving greater prominence to such parts of the native dialect as were common to the South. The Southern conjugations must at all times have been familiar, at least in dignified composition; but other conjugations were *popularly* used, and in the gradual disuse of these and other forms peculiar to the North the change consisted. We have many MSS. written in the Midland counties, in which all trace of the Northern dialect seems to have been studiously avoided; yet in very many of them may be found some verbal inflexion in *es*, or some other popular form, quite sufficient to betray the writer. These counties were long considered as belonging to the north of England. When the feuds between the two races at Cambridge and Oxford produced a schism, it was generally at Stamford or Northampton that the Northern men fixed the seat of their new University.

The Northern dialect was still broadly spoken, within the last three centuries, in the counties of Lincoln, Rutland, Derby, and Stafford; but it has been gradually giving way before a language so much more widely understood, till it is now to be found only in scattered localities amid the mountains of the North of England or in the Lowlands of Scotland. The Southern dialect began to yield at a later period. It was certainly spoken at the beginning of the seventeenth century in all the counties round London;[*] and Milton, when he issued forth

'To breathe
Among the pleasant villages and farms,'

must have heard a dialect around him in all essential particulars the same as the Somersetshire. Like the Northern dialect, it gradually retreated before its formidable rival; it lingered for a century in Wilts and Hampshire, and has now taken up a doubtful stand behind the Parret. Before another generation has passed away, the schoolmaster will probably have driven it from this its last place of refuge.

We will now take a rapid survey of the literature which belongs to the language whose history and peculiarities we have been endeavouring to trace. As is the case with the literature of most nations, we find that all its earlier specimens are metrical. We will therefore first call the reader's attention to our Anglo-Saxon poems; and to define more clearly the range of our present inquiry, we will briefly notice the properties which, at that early period, distinguished verse from prose.

An Anglo Saxon verse is made up of two sections, which together may contain four, five, six, or even more accented syllables. These sections are bound together by the law of alliteration, or, in other words, each verse must have at least two accented syllables (one in each section) beginning with the same consonant or with vowels. Sometimes, and particularly in the longer verses, there are two such alliterative syllables in the first section, as in the verse

mel|od for|thy *man*|e——*man*|cynne fram|

It is very incorrect to call this alliteration the 'essence' or the 'groundwork' of Anglo-Saxon verse. It is certainly an important part, but still a mere adjunct. The purposes it served were similar to those which are provided for by the final rhyme of our modern versification. The essence of Anglo-Saxon verse consisted in its system of rhythm. As the accents generally varied from four to six, it may be thought that the rhythm was too vague and loose, but in practice it is generally found sufficiently definite; and there are some of its rules which certainly give it a more scientific character than belongs to the system that has superseded it. For example, no sentence, nor any important member of a sentence, could end otherwise than at the close of a section. In our modern poets we often find a sentence ending in the midst of a section, or even immediately before the last syllable of the verse:

'His peers
Have found | him guil | ty—of high-trea | son. Much |
He spoke and learnedly for life.' &c.;

but such a verse would not have been tolerated in an Anglo-Saxon poem. We may indeed find scores of such verses in the printed editions of these poems; but not one single example, and we speak advisedly, in any Anglo-Saxon MS.

The 'Gleeman's Song'[*] is the oldest specimen extant of Anglo-Saxon literature. It is found in what is called the Exeter MS., one of the books left by Bishop Leofric to his cathedral, about the middle of the eleventh century. Of the Gleeman himself we know nothing, save what can be learned from the poem; but from certain passages in it we may gather, that he was born among the Mirgings, a tribe which dwelt on the marches that separated the Engle from the Swefe in the fourth century. In early youth, he attended a Mirging princess named Ealhild to the court of Eormanric, the celebrated king of the East-Goten, and who figures so often in Roman history under the name of Ermenricus.[†] His professional skill appears to have gained him the favour of this monarch, and of the great lords who frequented the court, and whom he visited in their respective governments. He afterwards accompanied a Mirging prince into Italy, probably during the inroad of Alaric, A.D. 401; and as Gothic leaders were now rapidly gaining a footing in the empire, he seems to have seized the opportunity of wandering through its provinces. On his return, he must have been an eye-witness of the wars waged between Ætla (Attila) and the East-Goten; and as Ætla's accession dates only in 433, and Eormanric died in 375, he must have been more than seventy when he wrote the poem.

The 'Gleeman's Song,' like many other Anglo-Saxon poems, has a short preface in verse, which appears to be of almost equal antiquity with the poem. It may be literally translated as follows:—

Wide travel told, his word-store unlocked
He, who most marvels, over earth,
And nations visited. Oft in Hall he gat
Memorable largess. Him from among the Myrgings
Nobles rear'd. He with Ealhild
(Leal artificer of love) in his first journey
Sought the home of the fierce king,
East from Ongle—the home of Eormanric
Wrathful treachour[‡] Gan he the number tell.
Many men I wot of,' &c.

Here follows a list of celebrated kings, from which the Gleeman selects for special notice Alexandreas, who appears to be Alexander of Macedon, and Wala, who is, no doubt, the Wallia that founded the kingdom of the Visigoths at Toulouse, A.D. 417. With the exception of Alexander, all of them appear to have been the Gleeman's contemporaries. After this enumeration he proceeds—

'So I fared through many stranger-lands,
Through the wide earth; of good and evil
There I tasted; from family parted,
From kinsmen far, widely I did my suit—

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[*] For specimens of the Middlesex dialect see Ben Jonson's 'Tale of a Tub;' 'Lear,' iv. 6, furnishes us with an example of the Kentish dialect; and nearly one half of 'Gammer Gurton's Needle' is written in the dialect of Essex

[*] The text of this poem may be found at the end of Kemble's 'Beowulf' (1837), a text and translation in Conybeare's 'Illustration of Anglo-Saxon Poetry' (1826), and in Guest's 'Hist. of English Rhythms' (1838).

[†] Amm. Marc., xxxi. 3, &c.

[‡] The cruelties perpetrated by Eormanric, towards the latter part of his life, are mentioued by the Latin historians (Jornandes, 'De Reb. Get.,' c. 24, &c.), and more than once alluded to in our Anglo Saxon poems.

Therefore may I sing, and story tell,
Relate 'fore the crowd, in mead-hall,
How me the high-born with largess blest.

I was with the Huns,' &c.

We have then the names of nations and of countries visited by him, which appear to be strung together in the order best suited to the alliteration. There are also certain notices of the great people by whose bounty he had benefited, and the reader will not be surprised at the Gleeman seeing only a liberal patron in the same monarch whom the author of the preface denounces as 'a wrathful treachour.' The whole concludes with a short eulogy on the dignity and privileges of his craft.

The great value of this poem lies chiefly in that string of names, which we have omitted as being so little interesting to the general reader. We do not stop to examine the question, whether any or how many of these notices have been interpolated during the five centuries which elapsed between the composition of the poem and the writing of the MS. Our knowledge of early Saxon history is so scanty, that all such speculations must be hazardous. But we may observe, that the Scriptures had been translated into a Gothic dialect long before the Gleeman began his wanderings, and we know from Roman history that during the fourth century nearly one-half of the Gothic tribes were Christians. We need not therefore necessarily feel suspicion, when we read of the Assyrians and the Persians, the Jews and the Idumæans; they may have been as well known to the Gleeman as to the Saxon monk who transcribed the MS. The chief interest however attaches to the mention of the various Gothic, Slavish, and Finnish races. In tracing their history, the 'Gleeman's Song' is the great link which connects the knowledge gained from Latin sources with the information gleaned from the Middle-Age chronicle. In many instances it furnishes the only means of penetrating the mystery which surrounds these races. There are tribes, still to be found between the Wolga and the Vistula, which we can identify with others named by the Gleeman, and thereby prove to have had a political existence fourteen hundred years ago, of whom hardly another trustworthy memorial can be found, till within the last two or three centuries. The helps which it affords us in unravelling the web of Gothic fiction are also most valuable, and may, if rightly taken advantage of, save us from much of that speculation in which German scholars have indulged so largely. To write a full and satisfactory exposition of this song would require a volume, but till it be written the history of modern Europe must remain incomplete.

There are two other poems, which must have been composed before the Engle left the Continent, the 'Battle of Fins-burgh,'* and the 'Tale of Beowulf.'† The first of these is a mere fragment, and appears to have belonged to one of those historical songs which Tacitus (*Germ.*, 2) represents as the only literature of the antient Germans. The other is chiefly taken up with the relation of two of Beowulf's adventures: the first against a monster called the 'Grendel;' the second against a terrific 'worm,' or 'earthdrake.' The poem has come down to us in a modernised form, and the mixture of Christian and heathen notions is sometimes singularly curious. For the most part, the nature of the subject, and the marked change that takes place in the rhythm, enable us to lay our finger on the very line where the interpolation begins. The following is one of the attempts to reconcile the old superstitions and the new creed:

'The grim stranger was Grendel hight—
Mighty pacer of the March; who held the moors,
Fen and fastness—land of the Fifel-kin.

The hapless man long had kept it,
Sithen his Maker him had doomed.
On Cain's kin the slaughter avenged
The eternal Lord, for that he Abel slew;
For joy'd he in that feud, but him out-drave
His Maker, for the sin, far from mankind.
Thence evil births all proceeded,
Ettyns, and Elves and Orknees;
So too the Giants, that with God fought
A long throw—for it he paid them meed!'

The Goths seem to have peopled every solitude with a race of monsters called the Fifel-kin. The sea, the moor, the fen, the march, or desert track which surrounded the territory of every Gothic tribe, were their dwelling-place. The battle, by which Offa settled the marches between the Engle and the Swede, was fought at Fifel-door (see 'Gleeman's Song'), and Alfred, wl [illegible] Troy, launches him on Fifel-[illegible] deep. Ettyns were long remem[illegible] stitions:

'They say the King of Portugal cannot sit at his meat, [illegible] ettyns will come and snatch it from him.'
Beaum. and Fl., *Knight of* [illegible]

Elves still live in our poetry; and ge[illegible] (notwithstanding the [illegible] nk t[illegible] them into rebel [illegible] rify or [illegible] The Orknees are [illegible] the Italian roman[illegible]

Some of the oldest pieces of poetry, [illegible] removal of the Engle to this country, and [illegible] the songs of Cædmon.* The circu[illegible] called forth the talents of this poet are [illegible] as he must have known many of Cædm[illegible] his account may be looked upon as a [illegible] facts. Cædmon, it appears, was neatherd [illegible] of Whitby, then under the government of the celebrated Hild. One day at s[illegible] passing from hand to hand, and it [illegible] amuse the company, he stole from the [illegible] fits of diffidence which so often overtake [illegible] As he slept in the neathouse, some one, [illegible] raged him to sing, and the song he c[illegible] was next day repeated to an admiri[illegible] his reputation as a poet, and gain[illegible] the abbess. He became a monk; was [illegible] who had received the gift of song from above: [illegible] death his body was enshrined, and valued [illegible] most precious relics by the monks of Whitby.

Only six of Cædmon's poems have reached us. [illegible] ject of the first is the Creation; that of [illegible] Temptation and Fall, to which is added, [illegible] ally, a narrative of the events recorded in [illegible] offering of Isaac; the third relates the Exo[illegible] the story of Daniel; and the Torments of the [illegible] Christ's Harrowing of Hell, followed by his [illegible] Glory, are the subjects of the other two. [illegible] he also wrote on our Lord's Incarnation [illegible] also on the Advent of the Holy Ghost, and [illegible] the Apostles. What remains is equal in le[illegible] half of the 'Paradise Lost.'

Cædmon appears to have been the first Eng[illegible] exchanged the images of the old mythology fo[illegible] beauties of Christian poetry. Perhaps there [illegible] individual who exerted a greater influence [illegible] modes of thought and expression; and [illegible] alone, if on no other, he must rank with t[illegible] of our literature. For six centuries he [illegible] whom all imitated and none could e[illegible] of his verses may be found in the [illegible] of [illegible] succeeding poet. To point out the [illegible] the admiration of Bede, and which our [illegible] only trace to the inspiration of Heaven, w[illegible] tical analysis that might be thought [illegible] mention however, as one of the greatest, [illegible] which he exercises over his rhythm. With a [illegible] march of Milton himself is not more stately; [illegible] every outpouring of joy or exultation his rhyt[illegible] ward, as if conscious of the feelings it bore [illegible] We have reason for believing that to this b[illegible] fathers were deeply sensitive, and that [illegible] no small portion of his popularity. Am[illegible] tors of this great poet we should perh[illegible] bishop of Shireburn. His poems were a[illegible] people in the days of Malmesbury, but are [illegible] probably lie unowned amid the heaps of [illegible] which fill our Anglo-Saxon MSS.

We have called the 'Battle of Fins-b[illegible] an [illegible] poem: another poem of the same [illegible] wri[illegible] death of Byrthnoth,† who bravely fe[illegible] Danish inroads, A.D. 993. (Hume, *H*[illegible] now lost, were written in the eleventh century, by [illegible] Hereward's chaplain, on the warriors of our [illegible] and the songs commemorative of Hereward's [illegible] Ingulf tells us were in his day so popular, [illegible] written by the same hand. There can be little d[illegible] many of the Old-English romances, as 'Horn,' '[illegible]' 'Bevis of Southampton,' 'Guy of Warwick,' &c., [illegible]

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[*] The text was published by Hickes from a MS. now lost.

[†] Text and translation by Thorkelin (1815), by Kemble (1837).

[*] Text published by Junius; text and translation by Thorpe.

[†] Text published by Thorpe, in his 'Analecta.'

adaptations of Anglo-Saxon poems. Occasionally the subject was taken from foreign sources, of which the 'Tale of Judith,'[*] probably written in the tenth century, affords us a splendid example. The 'Tale of Apollonius of Tyre'[†] is in prose, and a mere translation from the Latin.

There are other songs preserved in our chronicles, and closely allied to those last mentioned, but which are much shorter, and partake more of the lyrical character. Among them may be enumerated the Brunanburgh war-song,[‡] Edgar's coronation song,[§] the two songs which commemorate the death of this monarch,[§] and the elegy written on the death of the Confessor.[‖] The first and last of these are among the noblest specimens of Anglo-Saxon poetry.

A great deal of Anglo-Saxon verse was written during the eleventh century. One of the writers seems to have been called Deor. His name occurs in a poem[¶] which exhibits many difficulties of construction, and perhaps some blunders of transcription; but it may be gathered that he was *scop* or minstrel to the Danish princes who succeeded Knut, and he appears to have lost his place at court when the Confessor mounted the throne of England. The name of Cynewulf has also been extracted[**] from certain poems found in the Exeter and Vercelli MSS. It was hid in a kind of riddle, similar in character to our modern acrostic. He was probably the compiler of the two MSS., and may have been the author of much of the poetry which they contain.

But the noblest relic of this period is the Psalter published some five years back by the University of Oxford, from a MS. preserved in the 'Bibliothèque du Roi.' In the first part, each psalm has an Anglo-Saxon translation in prose; and also a preface giving some account of its history, general scope, and tendency. The translation often paraphrases the Latin, so as to show more clearly its doctrinal or prophetical meaning: but from the 50th Psalm, the translation is metrical, and though generally literal, exhibits many cases of glaring misconstruction. The prefaces also disappear, and the whole seems to be the work of a man very slenderly provided even with the rudiments of learning. This deficiency however may now be considered as amply compensated for by the high character of the poetry. Some of the psalms are translated with a terseness and also an elegance, which place the translation far above any of our modern versions, and there is occasionally a Miltonic sweep of language, that has not often been surpassed even in the choicest specimens of our sacred poetry.

A note in the MS. informs us that a priest named Wulfwin Cada 'wrote it with his own hand' (manu suâ conscripsit). We think it extremely probable that Wulfwin copied from some manuscript the prose version as far as it went, and then drew on his own resources. There are numberless instances of transcribers altering and continuing the work they were copying. Most of our MS. chronicles were transcripts up to a certain date, and were then continued as original compositions. The verb *conscripsit* shows it was a compilation; and if Wulfwin had before him a metrical translation, he would hardly, with that passion for stately language so common among his countrymen, have postponed it to the prose version. To Wulfwin Cada we think may fairly be ascribed both the faults and the merits of the metrical translation.

Among the most important prose works of our Saxon literature must be ranked those extraordinary compilations which are commonly called (as if they constituted but one work) the 'Saxon Chronicle.' The earliest copy of a Saxon Chronicle now extant is the Plegmund Manuscript, in the library of Corpus Christi College, Cambridge. It is written, as Wanley observes, in the same hand to the year 891, and in hands equally antient to the year 924. After that date it seems to have been continued and interpolated by various transcribers, whose notices of Christ Church, Canterbury, leave little doubt that the volume was once the property of that cathedral. As Plegmund was consecrated archbishop in 890, and died in 923, it has been inferred that the original text was compiled by his order, and continued from time to time under his direction. The internal evidence favours this supposition. The notices which it contains respecting the operations of Alfred and his immediate predecessors could hardly have been furnished by any but those who were present at them, and were probably the substance of conversations which had passed between the prelate and the king.

The next copy, in point of time, is the Dunstan MS. in the British Museum. This is also a Canterbury manuscript, and appears to have belonged to St. Austin's Abbey. It is written throughout in the same hand, and ends in the year 977. As Dunstan was then archbishop, and as the handwriting resembles that of other manuscripts ascribed to him, he has been named with some degree of confidence as the transcriber. However this be, it must have been written by a man of scholarlike attainment. We have only to compare the passages which relate to the period after Plegmund's death, with the corresponding passages in the Christ Church manuscript, to see at once its superiority. This is particularly striking in the poetical portions. The noble ode on the battle of Brunanburgh would have remained for ever mutilated, and in parts unintelligible, but for the copy preserved in the Dunstan Chronicle.

Besides these two chronicles, we have a Worcester, an Abingdon, another Canterbury Chronicle, and a fourth which appears to have been written at Peterborough. It has been inferred (chiefly for reasons connected with the handwriting) that these were compiled respectively in the years 1016, 1048, 1058, and 1125. We have also divers transcripts and collations made by Lambarde, Junius, Josselyn, and other antiquaries of the sixteenth and seventeenth centuries, some of which were evidently taken from manuscript authorities no longer extant. Josselyn appears to have had in his possession a second Peterborough Chronicle; and Lambarde's transcript in Trinity College, Dublin, is thought to have been made from an antient manuscript which perished in the fatal fire that destroyed so many of our Cottonian treasures.

The Plegmund, the Dunstan, the Abingdon, and the antient chronicle transcribed by Lambarde, all began with Cæsar's invasion. The Worcester, Peterborough, and latest Canterbury manuscripts begin with a description of Britain, extracted chiefly from Bede and Orosius. Then follow (with variations in the different manuscripts) the accessions of the Roman emperors, with the deaths of the apostles and of various popes to the year 464. At this year is inserted an account of the arrival of Hengist and Horsa, which is somewhat difficult to trace to its proper source; but the four entries which follow, we have no hesitation in classing among the 'writings of the antients' mentioned by Bede, and the 'histories of the English' alluded to by Nennius:—

'An. 455. Now Hengest and Horsa fought with Wyrtgeorn the king, in the place which is called Ægeles-ford, and his brother Horsa there they slew; and after that Hengest took to the kingdom and Æsc his son.

'An. 457. Now Hengest and Æsc his son fought with the Brits in the place that is called Creccan-ford, and there slew they four thousand men, and the Brits then forsook Cent-land and with much fear fled to Lunden-bury.

'An. 465. Now Hengest and Æsc fought with the Weals nigh Wippeds-fleet, and there twelve Wealish aldermen they slew, and of their own men a thane was there slain, whose name was Wipped.

'An. 473. Now Hengest and Æsc fought with the Weals and took untold booty, and the Weals fled the Englen, as it were fire.'

If the reader be startled at finding the name of Engle in what must have been a Yutish Chronicle, he must recollect that Ida, when laying down laws for his West-Sexe, recognises only two races, the Welsh and the English. None of the invading tribes, or 'kins,' as they were termed, seem to have refused the name of Englishmen, and in some of the chronicles the very Yutes of whom we are now speaking are termed the Engle-kin. We see no reason why *two* of these entries may not even belong to the period when the fearful struggle they commemorate was yet in progress.

The antiquaries of the sixteenth and seventeenth centuries seem to have assumed that the Anglo-Saxon monasteries kept a regular record of contemporary events; and there are certainly grounds for believing that registers of a certain kind were really kept by them. Bede's 'History' (iv. 14) has been referred to in proof of this. He tells us, that in

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[*] Text published by Thorpe, in his 'Analecta.'

[†] Text and translation by Thorpe (1834).

[‡] Text and translation by Price, in his edition of Warton's 'Hist.,' i. 87; and by Guest, in the 'Hist. of Engl. Rhythms,' ii. 61.

[§] Text and translation in Ingram's edition of the 'Saxon Chronicle.'

[‖] Text and translation in Ingram's 'Chronicle,' and in 'Hist. of Engl. Rhythms,' ii. 71.

[¶] 'Hist. of Engl. Rhythms,' ii. 325

[**] 'Archæologia, xxviii. 12.

the year 681 a boy, who was an inmate of Selsey Abbey, was seized with the plague, which was then desolating the country. As the poor lad was lying on his bed, he was accosted by two angel-visitants, who bade him tell the frightened monks that the plague would spread no farther, that it had been stayed by the prayers of Oswald, of whose death that very day was the anniversary. 'Let them,' said Saint Peter, for no less a person is the speaker, 'search in their books (in suis codicibus) in which are recorded the deaths of deceased persons (defunctorum depositio), and they will find that on this day he was taken,' &c. The abbot, we are told, believed the boy's words, and straightway went and searched in his chronicle (in Annali suo), and found that on that very day King Oswald had been slain,' &c. Here reference seems to be made to some public register of the convent; and this register, or the earlier MS. it was copied from, seems to have furnished materials for the Peterborough Chronicle.

'An. 642. Now was Oswald, king of the Northhymbre, slain,' &c., 'upon the Maser-field, on the day called the nones of August,' &c.

The mention of the day on which an event occurred, is rare in our chronicles; it is therefore probable that we have here the very passage which the worthy monk was sent in search of.

That there were also public (or perhaps we might say national) registers, in which were recorded the accessions, &c. of the kings, we also gather from the same venerable historian. We are told (*Hist.*, iii. 4), such was the horror excited by the cruelties of the Welshman Ceadwalla, and the apostacy of the Northumbrian kings, that 'it was resolved upon by all who had to reckon the chronology of the kings (regum tempora computantibus) that the memory of the faithless kings should be blotted out, and the year assigned to the reign of the king next following,' &c.; and he elsewhere adds, with studied phraseology, 'unanimo omnium consensu firmatum est,' *Hist.*, iii. 9. In the Chronicles we have the entry—

'An. 634.———And Oswald also took to the kingdom of the Northhymbre, and he reigned ix. winters. They assigned him the *ninth*, on account of the heathenism which they practised who reigned the one year between him and Eadwine.'

Here we find, within a century after Ida landed at Bamborough, a register kept of the Northumbrian kings, and general interest excited as to the entries made in it. From details mentioned by Bede, and which could only have been supplied by written documents, it is clear that these historical notices reached to the times of paganism. They must have been originally written in English, and with Runes, those antient characters which were only partially given up when Christianity introduced the literature of Rome, and which occasionally make their appearance in our MSS. to the end of the eleventh century. A too literal translation of these venerable documents, no doubt, introduced the many *Anglicisms* to be found in the works of Bede, and even of the Welshmen Nennius and Asser. On this ground only can we account for the intrusion into the pages of scholars like the first and last of these writers, of such phrases as 'victoriam sumpsere' (sige namon, An.-Sax.), 'loco funeris dominati sunt' (ahton wælstowe geweald, An.-Sax.), &c.

With these materials at hand, we may readily understand the course followed in the compilation of our early chronicles. Who were the parties that continued and interpolated these chronicles, is a question very difficult to answer satisfactorily. Archbishop Elfric, Saint Wulfstan, Hugh White the monk of Peterborough, and others have been named, with more or less of confidence, by different critics. For our own parts, we could never resist a feeling, almost amounting to conviction, that the character of William was the work of the venerable Wulfstan. It begins thus:—

'An. 1087.———If any wish to know what manner of man he was, or what state he held, or of how many lands he was lord, then will we of him write, as we him knew, we that have waited on him (the him onlocodon), and otherwhiles in his court have wonned,' &c.

There were few English churchmen at the close of William's reign who could put forth this claim to the confidence of their reader, and still fewer that could have drawn William's character with the freedom and at the same time with the Christian feeling that distinguishes the whole of this noble composition. Wulfstan was at that time the only English bishop; and when, after describing the cruelty and sternness of the king, he adds the prayer, 'may the Al[illegible] to his soul mercy, and grant him of his sins [illegible]. [illegible] does not feel that the moral qualities of the writer [illegible] eminent as the opportunities enjoyed or the [illegible] improved them?

Among Anglo-Saxon prose writers, we [illegible] the name of Alfred. His chief works are [illegible] the Latin, and of these the most remarkable [illegible] versions of Bede, Orosius,* and Boethius.† Certain [illegible] of the last-named author he has also paraphrased in verse.‡ Among what may be termed his original works, are the accounts of the voyages of the two Northmen Wulfstan and Ohthere, which were inserted in Hakluyt's collection, and have been the subject of so much comment and criticism.

Archbishop Wulfstan, better known by the name of Lupus, was a voluminous writer of homilies. [illegible] translated from Worcester to York in 1002, and [illegible] carefully distinguished from the Saint Wu[illegible] mentioned. A still more celebrated divine was [illegible] great champion who led the English church in [illegible]ance to the Romish innovations of the eleve[illegible]. As might have been expected, his authority was app[illegible] to, and with powerful effect, by the friends of the Reformation. One of Archbishop Parker's works is entitled 'A Testimony of Antiquity, showing the antient Faith of the Church of England, &c., being a Sermon transl[illegible] Latin into English by Ælfric, abbot of St. Alban's. [illegible] required all the exertions of the new theologic[illegible] founded by Lanfranc and Anselm to keep under the principles so deeply sown by Elfric.

We will close this notice of Saxon literature by [illegible] that the influence it has exercised upon the mo[illegible]ture of the country has been much underrated. [illegible] out maintaining, as some authors have done, that [illegible] diligently studied Cædmon, yet we do not fear to [illegible] some favourite images, and even certain ter[illegible] of e[illegible]sion, may be traced through our literatu[illegible] century, from the pages of the Saxon *scop* [illegible] Spenser and of Shakspere. The mistaken cr[illegible] some of these have called forth might afford [illegible] instructive comment; and serve in some measure to teach us the value of a literature which has been so much neglected.

SAXONS is the name of a branch of the G[illegible] nation. Their name is derived by some from that of [illegible] Saces on the Indus, by others from *sachs*, an ax, and by others it is traced to the word *sassen*, that is, 'settled' in contradistinction from those German tribes who led a sort of nomadic life. The earliest writers who mention the Saxons describe them as neighbours of the Danes, south of the Cimbrian Chersonesus. (*Geograph. Ravenn.* iv. 17.) Ptolemaeus also speaks of islands of the Saxons which were probably the modern islands of Eiderstedt, Nordstrand, Wicking Harde, and Böking Harde. Orosius (vii. 32) says that they inhabited a marshy country which was almost inaccessible to strangers. Towards the south-west they seem at first not to have extended beyond the Elbe. Tacitus, though he speaks of the Angli and Varini, who must have been close neighbours to the Saxons, does not mention them.

The similarity of their language to that of the Persians and antient Indians affords reason for believing that the Saxons were of Eastern origin; but how and when they came to occupy the north-western extremity of Germany, are questions which history cannot answer. Thus much only is certain, that at first they occupied a great part of the country between the Elbe and the Cimbrian Chersonesus; but when, during the migration of the barbarians, the neighbouring tribes changed their countries and migrated towards the south, the Saxons likewise began to extend in the same direction, and at last we find them occupying the country between the Elbe, the Rhine, the Lippe, and the German Ocean. This extensive tract of land is called by Anglo-Saxon writers Old Saxony, to distinguish it from New Saxony, or England.

In the third century the Saxons often landed on the coasts of England and France, and ravaged the maritime districts; but about the middle of the fifth century (445) a large body of Saxons and Angles, led by Hengist and Horsa sailed over to England, and established permanent settlements in this island. The Angles however seem to have prevailed in numbers or influence, for it was they that gave the name to their new country, Angel-land, Anglia (England), though it was sometimes called Saxonia Transmarina. The name Anglo Saxons, which comprises both Angles and Saxons, was invented by later historians for the sake of convenience. The history of the Saxons who settled in England, and here, together with the Angles, became the origin of a new population, henceforth forms part of the history of England. [ANGLES; ENGLAND.]

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* Text and Transl. by Barrington (1772).

† Text and Transl. by Cardale (1829).

‡ Text and Transl. by Fox (1835).

Those Saxons who remained in Germany conquered, about 530, conjointly with the Franks, the northern part of Thuringia as far as the little river Unstrut, but soon after gave up the eastern part of their conquest to a Slavonic tribe. The southernmost of the Saxons, about 550, became tributary to the Franks, to whom they paid an annual tribute of 500 cows. In proportion as the Saxons advanced towards the interior of Germany, and became better acquainted with the advantages of agriculture and the breeding of cattle, they gradually abandoned their former piratical mode of living, but remained nevertheless a spirited and warlike people.

Towards the close of the seventh century we find the Saxons divided into three great tribes, viz. the Ostfali on the western side of the Elbe, the Westfali in the country between the Rhine, Lippe, and Ems, and the Engeri in the centre, between the two former tribes, that is, on both banks of the Weser. Their hostile feeling towards the Franks was kindled into a war under Charles Martel, who conquered some Saxon districts on the northern banks of the Lippe, and made their inhabitants tributary. This however was only a prelude to the great and bloody wars which, with several interruptions, were carried on by Charlemagne from 772 till 803. During these wars many thousand Saxons fell in battle, and thousands were put to death because they refused to adopt Christianity. But they held out to the last, even after their chief Wittekind had submitted and become a Christian. The treaty of Selz on the Saale (803) at last terminated the war: the Saxons agreed to become Christians, and were put on a footing of equality with the Franks. Henceforth their history forms a part of that of the Carlovingian empire. To diffuse a knowledge of Christianity among them, and to establish the new religion more firmly, Charlemagne founded seven bishoprics, and from the places he appointed as the seats for these new ecclesiastical dignities, we may see the extent of country which they then occupied. The seats of the bishops were Osnabrück, Verden, Bremen, Paderborn, Minden, Hildesheim, and Münster.

SAXONY. Taken in its most extensive sense, the name of Saxony formerly designated a very large tract in Northern Germany, extending from the Weser on the west, to the frontiers of Poland on the east. No term in geography has been used with greater latitude of signification, and no states have been subject to more frequent territorial changes than those comprehended under this general name. It was not till the restoration of peace in 1495, by the emperor Maximilian I., that Germany was divided into ten circles, when the extensive tract of country hitherto called Saxony was divided into three circles, those of Westphalia, Lower Saxony, and Upper Saxony. The last of these, which might more properly have been called East Saxony, comprised the electorates of Brandenburg and Saxony, the duchy of Pomerania, and several small principalities.

THE KINGDOM OF SAXONY was formed of the electorate of the same name. The duchy of Saxony, to which the electoral dignity and the office of hereditary marshal of the empire were attached, was however no part of the antient German duchy of that name (which was composed of Lauenburg and a tract on the other side of the Elbe), but a Wend or Vandal province which Albert the Bear, margrave of Salzwedel, of the house of Ascania, had conquered, and left to his son Bernhard. This Bernhard received from the emperor Frederick Barbarossa (after Henry the Lion had been declared under the ban of the empire) the dignity of duke of Saxony, to which were attached a part of Engern and Westphalia, extending from the Weser, which separated it from Eastphalia, westwards to the Rhine. But Bernhard not being powerful enough to maintain the rights attached to his dignity, and to take possession of the duchy assigned to him in Westphalia, most of the Saxon allodial proprietors became immediate estates of the empire, by which the duchy was dissolved, and its name transferred to the country inherited by Bernhard from his father, to which, from that time, the ducal dignity was attached. The house of Ascania becoming extinct on the death of Albert III., in 1422, the emperor Sigismund invested Frederick the Warlike, margrave of Meissen, with the electoral title and the duchy of Saxony. The splendour of his new dignity, united with his eminent personal qualities, rendered Frederick one of the most powerful princes in Germany. He was succeeded in the electoral dominions by his son Frederick the Mild, who reigned from 1428 to 1464. On his death, his dominions were divided between his two sons, Albert and Ernest, who were the founders of the Albertine and Ernestine lines, the former of which still reigns in the kingdom of Saxony, and the latter is divided into the four branches of Saxe-Altenburg, Coburg-Gotha, Meiningen, and Weimar. The electoral dignity was inherited by Ernest, who was succeeded by his son Frederick the Wise, who founded, in 1502, the university of Wittenberg, where Luther and Melanchthon commenced the Reformation; and though Frederick did not openly espouse the cause of Luther, yet it was probably owing to his personal influence with the emperors Maximilian and Charles V., and to his able and prudent conduct, that the great reformer did not experience the fate of John Huss. Frederick was succeeded, in 1525, by his brother John the Constant, who died in 1532. At Frederick's death, the doctrines of the Reformation had taken such deep root, that neither the anathemas of the Vatican, the ban of the empire, nor the disastrous wars which were not ended till the peace of Westphalia in 1648, could extirpate them. Accordingly, though John Frederick the Magnanimous, being defeated and taken prisoner by the army of Charles V. in the battle of Mühlburg, in 1547, was deprived of his electoral dignity, which, with the greater part of his dominions, was given to his cousin Maurice, margrave of Meissen, yet Maurice powerfully supported the Protestant cause, and, after a short campaign, obliged Charles V., in 1552, to sign the Convention of Passau, which has been since considered as the bulwark of the religious freedom of Germany.

In 1697 the elector Augustus I. was induced, by the temptation of obtaining the crown of Poland on the death of Sobieski, to embrace the Roman Catholic religion. Charles XII., king of Sweden, not only conquered Poland, but invaded Saxony, which suffered very severely till 1708, when it was relieved by the march of Charles into Russia, and his defeat there; after which Augustus resumed the crown of Poland, which he retained till his death in 1733. Saxony remained neutral in the war between Prussia and Austria which commenced in 1740; but was unfortunately tempted, by the promises of Austria, to take part in the Seven Years' War, in which, instead of obtaining an accession of territory, the Saxon court saw its dominions ravaged and its subjects ruined in the contest with Prussia. The peace of 1763 left the country burdened with an enormous debt, which made the government and the people sensible of the necessity of a total change in the political system, of reducing the military establishment, and endeavouring to lessen the burden of the public debt. In the war with France in 1793, Saxony furnished only a small contingent, and took no decided part; but in 1806 the elector sent all his troops to support the king of Prussia. The ruin of the Prussian power by the battle of Jena enabled Napoleon to gain the Saxons to his cause by the grant of many considerable advantages. Prussian Poland was added to the dominions of Saxony, under the title of the grand-duchy of Warsaw, and the title of elector was changed to that of king. Further cessions from Austria, in 1809, nearly doubled the territory of Saxony; but the adherence of the king to the cause of Bonaparte proved fatal to him in 1813, when the Russians occupied Poland, and, with the Prussians, made Saxony the theatre of the great struggle with the French emperor. In that year the battles of Lützen and Bautzen were fought, and were succeeded by the attacks on Dresden, the great battles of Leipzig, and the retreat of Bonaparte to the Rhine. The people of Saxony had hoped that their attachment to the cause of Germany, as proved by the desertion of their troops from the French army in the battle of the 18th of October, would secure the integrity of their territory. The fate of Saxony was to be decided in the congress of Vienna, and it was at first proposed that the whole kingdom should be united with Prussia, for which a territory in Westphalia, with 300,000 inhabitants, was offered to the king as an indemnity, which was refused. At length it was decided that the kingdom should be divided, and on the 18th of

May 1815, the king signed a treaty of peace with Prussia, by which he gave up more than half his dominions in point of extent, and nearly the half of the population, or a territory of 7880 square miles, with 845,218 inhabitants.

Inhabitants.—The population, according to the census of 1837, was 1,652,114, of whom 1,617,892 were Germans, 33,352 of Slavonian descent, 825 Jews, and 72 Greeks. The Slavonians were the original inhabitants, and their subjection was effected in the tenth century by king Henry I. They are now known under the name of Wends, and live apart from the Germans: they do not intermarry with them, though they inhabit the same towns or villages. Thus they have preserved their language and several peculiar customs. They are only found in that part of Saxony which is east of the Elbe, especially in Bautzen and in the vicinity of that town.

Surface and Soil.—The river Elbe, traversing the kingdom from south-east to north-west, divides it into two unequal portions, between which a considerable difference exists in wealth and productive powers.

The eastern and smaller portion, which comprehends the south-western part of the country, formerly called Lusatia, is less favoured by nature. The most elevated part of the country lies contiguous to the boundary of Bohemia, and is known by the name of the Mountains of Lusatia. It does not however present a chain of mountains, but is an elevated flat, which towards the south descends into Bohemia with a rather rapid slope, but towards the north forms extensive plains, which are nearly level, lowering with an almost imperceptible slope. On these plains rise several masses of rocks in the form of small table-lands, and in some places there are numerous small conical hills. The base of the rocks is granite or gneiss, but the more elevated parts consist of basalt. The most elevated summits, proceeding from east to west, are Mount Oybin and the Hochwald near Zittau, which rise respectively to 1680 and 2520 feet; Mount Lausche, which attains 2637 feet; the Schlossberg near Stolpen, which is 1146 feet high; the Great Winterberg on the right bank of the river Elbe, which is 1836 feet; the Lilienstein, on the right bank of the Elbe opposite Königstein, which is 1338 feet high; Mount Catta near Pirna, which attains 1176 feet, and the Porschberg near Pillnitz, which has an elevation of 1182 feet above the sea-level. The western declivity of this region is intersected by numerous depressions, ravines, and valleys, and, on account of its picturesque beauties, is frequently resorted to by travellers. It is known by the name of the Saxon Switzerland, and extends along the Elbe from Pirna to the Winterberg, and from 6 to 8 miles from the river. The northern boundary-line of this region may be indicated with tolerable exactness by a line drawn from Dresden eastward to Bautzen. It is in general a poor country, partly covered with forests of rather indifferent growth, and partly with heath, but there are tracts which make good sheep-walks. The sheep are noted for the quality of their wool, which is well known under the name of Saxony wool, and fetches the highest price in the market. Agriculture is very limited; potatoes and oats succeed best, and in some parts flax. There is however a large tract of superior fertility, which occupies the most eastern part of the kingdom, on both sides of the upper course of the river Neisse, and constitutes a wide depression in the elevated region. The surface is hilly, but in general it produces all kinds of grain, and nearly as much as is required for the consumption of the large and populous manufacturing villages which surround the town of Zittau on the east, north, and west. The plain of Bautzen, which lies along the northern base of the elevated region, is still more fertile, and supplies corn for the consumption of the manufacturing districts. The mineral wealth of this region is far from being considerable. Some coal and iron are found, especially in the neighbourhood of Zittau; and along the river Elbe there are some quarries of sandstone, the produce of which is exported.

The country, which extends from the base of this region northwards to the boundary-line of Prussia is a plain, on which there are a few isolated hills, among which the Keulenberg, near the town of Königsbrück, attains the height of 1362 feet above the sea. The soil of this plain is sandy or gravelly, and mostly unfit for cultivation: about half the surface is covered with woods, consisting almost entirely of coniferous trees, from which tar and pitch are made, and exported. In the cultivable tracts potatoes, oats, buckwheat, and millet, with some rye, are grown. The sheep-walks are extensive, but of inferior quality. Cattle, goats, and pigs are numerous.

The western or larger portion of Saxony, which is situated west of the river Elbe, is naturally divided into three regions, the mountainous, the hilly, and the plain. The mountain-region lies within the Erzgebirge, extends over the northern slope of that range, and is bounded on the south by Bohemia. The northern boundary-line of this region runs from Pirna on the banks of the Elbe, westward to Tharant, and thence to the south of west through Freyberg, Oederen, and Zschopau to Zwickau, whence it declines more to the south, terminating at Scheitz in the principality of Reuss. The whole of this region is occupied with mountain-masses, with rather steep declivities, which are furrowed in a direction from south to north by wide and open valleys, and in other directions by smaller valleys. The highest mountains occur on or near the boundary of Bohemia. The most elevated summit is the Fichtelberg, near 12° 56′ E. long., which attains an elevation of 3966 feet above the sea-level. Nearly north of it, near Annaberg, stand the Pöhlberg, 2706 feet high, and farther east, near Georgenfeld, the Lugstein, 2934 feet; and near Altenberg, the Kahlenberg and the Geisingberg, which are respectively 2922 and 2730 feet above the sea-level. West of the Fichtelberg are the Cluersberg near Eibenstock, which attains 3345 feet; and near Schöneck, the Rammelsberg and the Schneckenstein, respectively 3165 and 2886 feet high. A large portion of this region cannot be cultivated on account of the steep slopes of the mountains, but the soil in some parts appears to be fertile, as extensive tracts are covered with beech-forests, whilst others are covered with excellent pine-trees. These forests supply fuel for the numerous mines of this district. [Erzgebirge.] In the valleys of this region, whose mean elevation is stated to be between 1500 and 1600 feet above the sea, cultivation is limited to flax, potatoes, and oats, other grains not succeeding on account of the rigour of the climate. As these valleys are rather thickly inhabited, the population is chiefly supplied with grain from the regions lying farther north, and when the crops in these parts fail, the inhabitants of the mountain-region suffer from dearth.

The hilly region, which extends along the northern base of the mountains, reaches northward to a line drawn from Meissen on the Elbe westward to Döbeln, Kolditz on the Mulda, and Borna. This region exhibits an agreeable alternation of hills, vales, and plains of moderate extent. Its fertility in general is not great, though there are some productive tracts, among which the plains near Chemnitz and Zwickau are distinguished. But the whole region is cultivated with great care, as its agricultural produce finds a ready sale in the populous towns and villages of the mountain-region. Its mean elevation above the sea-level is stated to be between 750 and 800 feet, and though the winters are severe in most parts, they are not severe enough to prevent the cultivation of the common kinds of grain. Some parts, especially those along the river Elbe, which are much lower, are noted for their orchards, and in the vicinity of the town of Meissen a considerable quantity of wine is made. It is the most northern place in Europe where a drinkable, though inferior, wine is made to any extent. The region is not rich in minerals, with the exception of coals, which are found in extensive beds not far from Dresden and in the vicinity of Zwickau. Sheep, cattle, and horses are abundant in these parts.

The northern portion of Saxony west of the Elbe is a plain, and constitutes the most southern part of the great plain which extends to the shores of the Baltic. It contains however more hills than occur farther north. The hills are isolated, and generally low, except the Colmberg, west of Oschatz, which attains an elevation of 1134 feet above the sea-level. The general level of the country near the hilly region is about 600 feet, and where it borders on Prussia it varies between 290 and 360 feet. It is the most fertile portion of Saxony, and though it contains several tracts covered with heath, some extensive districts are distinguished by fertility. The most fruitful part is the plain of Lommatsch, not far from the banks of the Elbe, and contiguous to it is that of Meissen, which is not much inferior. The plain of Leisnig, on the Freyberger Mulda, the country surrounding the town of Leipzig, and the valley of the Elster, south of Leipzig, near the town of Pegau, are likewise among the most fertile tracts of Northern Germany. Agriculture is the principal occupation of the inhabitants, but it is united to the rearing of cattle and horses. Sheep abound in the less fertile tracts. The forests, which cover a considerable portion of the other parts of Saxony, are here of comparatively small extent.

Climate.—The climate must vary greatly in a country whose lowest point, the town of Strehla on the Elbe, is only 286 feet above the sea-level, while the highest, the Fichtelberg, attains nearly 4000 feet. According to meteorological observations, which have been regularly continued for several years at different places, it appears that the temperature of the northern plain does not differ much from that of the hilly region. The mean annual temperature in both regions appears to be 47·5°, or four degrees lower than that of London. The winter is rather severe, the mean temperature being 30° or a little less, whilst that of London is 39°. The temperature of the spring is 49°, and that of London 54°. The temperature of the summer is 62°, or one degree more than that of London. The temperature of the autumn is between 49° and 50°, or nearly six degrees higher than at London. Those districts which lie along the banks of the Elbe are the lowest parts of the region, and accordingly the temperature of Dresden and Meissen is from two to three degrees higher than those given in the above statement. The climate of the towns near the mountain-region, as that of Freyberg and Chemnitz, does not materially differ from that of the countries farther north, but in the valleys of the mountain-region the temperature is considerably lower. At Altenburg, which is 2475 feet above the sea-level, the mean annual temperature does not exceed 40°, that of the winter is 25°, of the spring 41°, of the summer 54°, or equal to the spring of London. The mean temperature of the autumn is about 41°. The quantity of rain which annually falls is stated to be 24 inches, but as the observations from which this result has been drawn have been made chiefly in the mountain-region, it is supposed that it is somewhat too high when applied to the whole country, and that in the hilly region and the plain it probably falls short of 20 inches. The prevailing winds are from the west and south-west; those from north-west and from south and south-east are also common; northern, north-eastern, and eastern winds are rare.

Rivers.—The principal river is the Elbe, which is navigable for large river boats through the whole of its course, as far as it lies within the boundaries of Saxony. It is joined, within Saxony only, by a few small rivers; but several rivers which have their origin in the mountain-regions of that country, and traverse it from south to north, fall into the Elbe after it has left Saxony. Though not navigated by river-barges, they are used to float down timber and fire-wood. The rivers which fall into the Elbe are the Black Elster, with its tributary the Röder, from the east, and from the west the Freyberger and the Zwickauer Mulda, which unite within Saxony, and the White Elster, with its tributary the Pleisse.

Natural Productions.—The vegetable kingdom yields corn, but not sufficient for the home consumption, potatoes, rape-seed, hops, flax, hemp, chicory, tobacco, madder, woad, saffron, medicinal herbs, anise, coriander, poppy, &c. Though the meadows are not equal to those of Holstein, they are however most carefully cultivated, and in the Erzgebirge are mown three, four, even five or six times in the year. Within these few years Spanish clover has been very much cultivated. Culinary vegetables are abundant, and large quantities are exported. With the exception of the mountainous district, Saxony resembles a vast orchard, the produce of which is a never-failing source of wealth to the inhabitants. The culture of the vine was introduced in the eleventh century. The annual produce, though not so great as formerly, is still 150,000 casks of 16 gallons. The culture of silk has not proved successful, the climate not being favourable to the growth of the mulberry-tree; yet the government is endeavouring to encourage it by the offer of considerable premiums. Almost a fourth part of the country is covered with forests, consisting chiefly of pine and fir. Of other timber-trees the most common are the beech and the birch; the maple, the elm, and the ash are less common, and the oak very rare.

Animals.—The breed of cattle has been very much improved within the last century. The horses are good, but there is no distinguished race, and the best are still imported from Mecklenburg, Moldavia, and Bessarabia. There are swine and goats in many parts of the country, and domestic poultry abounds. Bears and wolves are wholly extirpated; wild-boars are less numerous than formerly; foxes, badgers, and hares are found in great abundance; lynxes and wild cats are rare; birds of prey, with the exception of eagles, which are seldom seen, are everywhere met with. There are also bustards, storks, heathcocks, pheasants, partridges, and wild geese, ducks, and swans. The breeding of bees, formerly of great importance, has now declined. But of all the productions of the animal kingdom the most important is the breed of merino sheep, introduced in 1765 by prince Xaver, regent of the kingdom, who applied to the court of Madrid for some Spanish sheep and received as a present 300 merinos, with six shepherds and six dogs. Subsequent importations were made from Spain, so that at present there are above 2,000,000 sheep of the improved breed, and Saxon, or Electoral wool, as it is called, is preferred in England even to the Spanish; nay, merinos have even been sent from Saxony to Spain, because the breed has suffered much in that country from the long wars.

Minerals are extremely productive, though not so much so as formerly, because the mines, being worked to a greater depth, require more labour and expense. The number of workmen employed in the mines is about 9000, and the annual value of the minerals 1,800,000 dollars;—these are, some gold, copper 615 cwt., iron 80,000 cwt., lead 15,000 cwt., tin 2500 cwt., cobalt 9000 cwt., arsenic 6000 cwt., vitriol 20,000 cwt., likewise bismuth, nickel, zinc, antimony, quicksilver, calamine, rock crystal, amethyst, cornelian, garnets, diamonds, jasper, chalcedony, Labrador stone, good potters'-earth, the finest porcelain clay in Europe, basalt, serpentine, granite, marble, alabaster, fluor spar, sandstone, limestone, slate, porphyry, black amber, brimstone, alum, saltpetre, and coals. All the salt-springs are in the part of the kingdom ceded to Prussia, from which all the salt is imported.

Manufactures.—Next to England and the Netherlands, Saxony has, in proportion to its population, the most extensive manufactures. That of linen has declined, but still employs 60,000 persons. The most important branch is that of damask table-linen at Gross-Schönau (a thousand looms). Thread-lace of extraordinary beauty is manufactured in the Obererzgebirge and the Voigtland. The annual value of the linen manufactures is 3,000,000 dollars. Woollen manufactures are very extensive, and those of cotton have rapidly increased within the last fifty years. There are silk-manufactures on a small scale; sixty paper-manufactories; and tanneries, breweries, and distilleries in almost all the towns. The manufactures connected with the mines are of great importance, especially at Freiburg, which is the central point of this kind of industry, as also for founderies of cannon and balls, and for separating the more valuable metals from the ore. Cobalt is made into smalts, and some places are noted for the manufacture of verdigris. The manufacture of straw bonnets, mats, &c. employs 10,000 hands.

Commerce.—The centre of the commerce of the country is Leipzig. The inland trade amounts to 12,000,000 of dollars, of which 8,000,000 pass through the hands of the merchants of Leipzig, and 2,000,000 through those of Jewish merchants. The whole foreign and domestic trade of Leipzig at three fairs amounts to 18,000,000 of dollars. The book trade is likewise to the amount of some millions. The principal exports are, fine woollen manufactures to England, Spain, Turkey, and Russia, 400,000 dollars. Linen, lace, &c. to Italy, England, Spain, and France, 3,500,000 dollars; thread, wool, worsted, smalts, porcelain, straw manufactures, woodenwares, glass, fruit, timber, and mineral products. The imports are salt, cotton, silk, flax, hemp, colonial produce, salt and dried fish, fancy goods, &c. The value of the exports is said to exceed that of the imports by 3,000,000 of dollars.

Religion.—There is no state religion; the great majority of the inhabitants are Lutherans, but the royal family having embraced the Roman Catholic faith in 1697, that religion was in consequence tolerated, and since the treaty of Posen, in 1811, the Lutheran and Romish religions are placed on an equal footing, and the professors of both enjoy the same rights. The number of Roman Catholics does not however exceed 30,000.

Education.—Saxony holds a very high rank with regard to the number and the excellence of its institutions for education, and the general diffusion of knowledge, there being very few countries where the lower classes are so generally taught to read and write. The number of printing-offices and booksellers greatly exceeds that in any other country of equal extent. There have been eminent Saxon writers in almost every branch of learning; without entering into particulars, but rather referring to the accounts of Dresden, Leipzig, and other cities, we will mention in general the number of such institutions in the whole kingdom:—University of Leipzig, 1; high schools at Grimma and Meissen, 2; gymnasia, 11; seminaries for schoolmasters, 4; Mining Academy, 1; institution for teaching the management of forests, 1; military schools, 2; deaf and dumb school, 1; agricultural school, 1; Sunday-schools and schools of industry, 21; Roman Catholic schools, besides those in Upper Lusatia, 15; Academy of Arts at Dresden, 1; besides free schools for the poor in all the principal towns, and numerous societies for the promotion of various branches of art and science in the chief cities.

Revenue.—The revenue arising from the public estates, the regalia, and taxes is about 5,100,000 dollars per annum, and the expenditure not quite 5,000,000. This has been much reduced of late years, and the public debt, which in 1821 amounted to 21¼ millions of dollars, is now only 11,000,000. The military establishment is 13,000 men, the greater part generally absent on furlough, except at the time of the annual exercises.

The constitution is a monarchy with a representation divided into two Chambers, without the consent of which no law can be issued, altered, or authentically interpreted. The executive power is in the king, and in urgent cases, where the intended object might be defeated by delay, he may issue ordinances without waiting for the assent of the Chambers, for which however the ministers are responsible. The king cannot become the sovereign of another state without the consent of the Chambers. The crown is hereditary in the male line of the Albertine house of Saxony. If that becomes extinct, the succession devolves on the house of Weimar, then on that of Gotha, after which it passes to the collateral branches, and lastly to the female line. Saxony is a member of the German Confederation, and as such furnishes a contingent of 12,000 men and a contribution of 2000 florins. It has the fourth place in the German Diet, between Bavaria and Hanover, and has four votes in the full council.

Divisions of the Kingdom.—The whole kingdom is divided into five provinces, called circles, viz. Meissen, Leipzig, the Erzgebirge, Voigtland, and Lusatia, which are subdivided into bailliwicks, in all 42. No country in Europe, except the Netherlands, is more densely populated. On an average there are 263 inhabitants to an English square mile. In the Erzgebirge 310 to a square mile, and in the territory of Schönburg 464 to a square mile. There are 141 cities and large towns, 51 smaller towns, and 3260 villages. The principal towns, all of which are described in their alphabetical order, are,—Dresden (without military and strangers), 69,253; Leipzig, 47,514: Chemnitz, 22,265; Freiburg, 11,446; Plauen, 9030; Zittau, 8674; Bautzen, 8460; Meissen, 7740; Schneeberg, 6910: Annaberg 6700; Zwickau, 6410; Glauchau, 6300; Pirna. 5560. Other towns with more than 5000 inhabitants are, Grossenhain, 5760; Mitweida, 5600; Dobelm, 5559; Frankenberg, 5550; Zschoppau, 5384: and Oschatz, 5360.

SAXONY, PROVINCE OF, in the kingdom of Prussia, is situated between 50° 30′ and 53° N. lat., and between 9° 50′ and 13° 50′ E. long.; it is bounded on the north and north-east by the province of Brandenburg, on the south-west by the kingdom of Saxony, on the south by Gotha, Reuss, Weimar, and Hesse Cassel, and on the west by Hanover and Brunswick. It is divided into the governments of Magdeburg, Merseburg, and Erfurt, and is composed of almost the whole of the portion of Saxony ceded to Prussia at the Congress of Vienna, to which the principalities lying to the north of the duchy of Anhalt and to the west of the Elbe and the Havel have been added: the whole forms an area of 9700 square miles, with 1,564,187 inhabitants. The three duchies of Anhalt, a great part of Schwarzburg, the bailliwick of Alstedt belonging to Weimar, and that of Kalvörde belonging to Brunswick, lie entirely within the territory of this province.

The principal river is the Elbe, which traverses the province from south to north, and is joined in the north at Werben by the Havel, and in the south by the Saale. The greater portion of the province, viz. the whole district of Magdeburg to its extreme south-western border, and the larger (or eastern) part of the district of Merseburg on the
other side of the Saale, belong to the plain
Germany, and contain gentle eminences, b
tains. The western or smaller part of the
Merseburg and that of Erfurt are more mount
level, for on the one side branches of the
and on the other side those of the Thüringe
it; yet this part likewise contains extensive
plains, and the mountains and hills which
nowhere of considerable elevation, except in the
circle of Henneberg; on the south-west bor
vince is the highest mountain of Northern
Brocken, which is 3500 feet above the level of the

The soil, which is generally fertile, supplies th
population with the most important articles of
vince is unquestionably the most equally
tivated in Prussia; the districts of Magdeburg
produce a considerable surplus for exportation;
very generally cultivated; pulse, oleaginous
nary vegetables of all kinds, are amply
consumption of the inhabitants; a considera
wine is made, and with beer and brandy, the
verage manufactured in the province, is most
home consumption. In many parts of the gov
Magdeburg wood is scarce, and there is ba
anywhere except in the government of Erfurt
of horned cattle is numerous, and Berlin is in
from this province. The fine wool of the i
of sheep supplies not only the extensive woo
factures of the province, but furnishes a large
exportation. The mineral products are ant
and iron; there is also some silver, but
portant metal is copper, of which about
are annually obtained; there are also lime, g
baster, freestone, alum, and vitriol. The porce
tained near Halle is of very superior qual
salt from the saline springs furnishes a large
1835 the quantity was 1,272,446 cwt. The
are woollens, leather, calico, and linen. There
sugar-refineries in the province, and numerous
tilleries. The manufactories of tobacco, por
earthenware at Magdeburg and Althaldensleb
very large scale. The exports are wool, corn,
cotton manufactures, brandy, copper, iron and
and salt.

The most important commercial town is Mag
account of the facility of communication with
All the principal towns are described under the
heads—Aschersleben; Burg; Eilenburg:
Erfurt; Halberstadt; Halle; Magdebu
burg; Mühlhausen; Naumburg; Nordhaus
linburg; Salzwedel, Torgau; Weissen
tenberg; Zeitz.

SAY, JEAN BAPTISTE, a writer on politic
was born at Lyon in 1767, and died at Paris, Nov.
He came to the capital at an early period of the
and was one of the projectors and conductors o
entitled 'La Decade Philosophique,' one of the
ber of literary and scientific works that ma
existence during the Revolutionary storm.
18th Brumaire, Say was called to the trib
only semblance of a deliberative assembly whic
after the Revolution. It soon became the mere
of the First Consul's will, and Say ceased to be a
it at the time when Napoleon was named em
resigned an appointment, subsequently conferred
of receiver of taxes for the department of Allier.
wards established a manufactory of some kind
whole he appears to have passed a quiet and
engaged in his various works on political econo
lecturing on this and kindred subjects at the Co
des Arts et Métiers at Paris.

The great merit of Say consists in having re
science of political economy popular in France
lowed closely in the steps of Adam Smith;
having placed the doctrines of his predecessor in
luminous point of view by judicious arrangement
contain 'several accurate, original, and profound
(Ricardo), among which may be mentioned hi
of the nature and causes of gluts. [Political
vol. xviii., p. 341.]

The works of Say are:—1, 'Traité d'Economie
published in 1802; 5th ed., 1826. 2, 'Catechi
nomie Politique,' 1815; 5th ed., 1826. 3, 'L

s sur différents Sujets d'Economie Politique,' 1820.
urs Complet d'Economie Politique Pratique,' 6 vols.,
This in effect is the 'Traité' more amply and fami-
llustrated. The first and second works in the above
ve been translated into English. Say is the author
e smaller works, one of which is entitled 'De l'An-
e et des Anglais.'

RRI, or BIRRI, the name of a police force which
in the Papal and other Italian states. They were not
ary corps; they wore no uniform, and lived in their
uses; they received a small pay, and were furnished
rms. They were ready at any time of the day or
to rally at the summons of their captain, who was
Bargello, for the purpose of tracing and arresting bad
ters or suspected persons. Parties of them went their
in the towns at night. The Sbirri acted also as in-
, and assumed various disguises for the purpose.
were placed under the orders of the respective gover-
f the towns and districts. This body of men fell at
to great disrepute: they were open to bribery, and
ad a secret understanding with robbers and assassins.
were recruited from among bad characters, respited
als, &c. They have been replaced now almost every-
in Italy by the carabinieri, a regular military body
he French gendarmes, who are found much more
ve and trustworthy.

B. [Sheep.]

'BIES. [Itch.]

BRI'COLA, Mr. Swainson's name for a subgenus of
enus *Mitra*, in his subfamily *Mitrinæ*, of the family
dæ.

'EVOLA. There were many distinguished persons
ore this name.

ntus Mucius Scaevola was praetor in the year B.C.
nd in the following year had the government of Sar-
He may be the Quintus Mucius, a jurist, mentioned
mponius (*Dig.*, i., tit. 2, s. 37), if Mucius is the right
g there.

lius Mucius Scaevola, one of a family of jurists,
ribunus plebis B.C. 141, praetor B.C. 136, consul in
ar B.C. 133, and in the year 131 B.C. he was Pontifex
nus. Up to his time, says Cicero (*De Or.*, ii. 12), the
of every year were registered by the Pontifex Maxi-
and such registers were the Annales Maximi. This
la was a distinguished jurist, and also had the repu-
of being an able orator and an honest man. Cicero
of his juristical writings, and Pomponius attributes
rks to him. Scaevola is cited in the 'Digest' several
He was consul during the disturbances in which
us Gracchus perished, and his conduct was marked by
ation.

ntus Mucius Scaevola, commonly called the Augur,
nsul with L. Caecilius Metellus in the year B.C. 117.
said to have been the son of P. Mucius Scaevola, or Q.
aevola, as he is sometimes called, who was consul B.C.
nd grandson of Q. M. Scaevola who was praetor in
ar B.C. 215. He was less distinguished as an orator
or his knowledge of the Roman law (Jus Civile). He
cero's master, but he was then an old man, and after
ath Cicero attached himself to Quintus Mucius Scae-
he pontifex. It is not known that he left any writings
him, and accordingly he is not mentioned by Pom-
('De Origine Juris,' *Dig.*, i., tit. 2). He was the son-
of C. Laelius, and the father-in-law of the orator L.
us, and is one of the interlocutors in Cicero's treatise
ratore' (lib. i.), of the treatise 'De Amicitiâ,' and in
eatise 'De Republica.'

ntus Mucius Scaevola, commonly called the Pon-
to distinguish him from Q. M. Scaevola the Augur,
e son of Publius. He was the colleague of L. Cras-
tribunus plebis in the year B.C. 106, the year of
's birth, aedile in B.C. 104, and consul in B.C. 95. As
nsul of the province Asia, he distinguished himself by
isdom and justice of his administration; and the
s commemorated his happy government by establish-
festival called Dies Mucia. He subsequently attained
ignity of Pontifex Maximus. He was a man of strict
ty and great ability; a distinguished orator, and still
eminent as a jurist. (Cic., *De Or.*, i. 39.) After the
of the Augur, Cicero had the advantage of the society
e Pontifex, who formed many distinguished pupils,
h he did not profess specially to give instruction in the
C. Aquilius Gallus, one of the masters of Servius Sulpicius, was a pupil of this Scaevola. He perished in the consulship of the younger Marius, B.C. 82, being among those who were proscribed by him. The Pontifex was murdered in the temple of Vesta, where he had taken refuge, and the altar of the goddess was stained with his blood. (Flor., iii. 21; Cic., *De Or.*, iii. 3.)

This Scaevola was the first Roman who attempted to systematise the Jus Civile, which he did in a work in eighteen books. This work is mentioned by Gellius (vii. 15). It is also cited in the 'Digest,' where the name of Mucius is often mentioned; but there are no extracts from it. The Muciana Cautio took its name from him. (*Dig.*, xxxv., tit. 1, s. 72, &c.) He also wrote a book of Definitions (ὅροι), probably the first of the kind; and this is the oldest work from which any extracts with the author's name at the head were received into the 'Digest' (xli., tit. 1, s. 64; xliii., tit. 20, s. 8, &c.). The work on the Jus Civile was commented on by several subsequent jurists. Gaius (i. 188) speaks of certain books which he composed 'ex Quinto Mucio.'

SCÆVOLA, C. MUTIUS. [Porsena.]

SCAFFOLDING, a temporary erection of timber, usually for the purpose of supporting workmen and materials during the progress of a building.

In ordinary buildings the scaffolding requires very little notice. Poles are erected in a vertical position a few feet from the walls, their lower ends being inserted in the ground. Wherever a platform is required for the workmen, a horizontal pole is tied to the uprights, parallel with the wall; and from this horizontal pole cross-pieces extend to the wall, into which their ends are received, to support a flooring of planks. As the building rises, the scaffold is strengthened by diagonal poles, the lower ends of which rest upon the ground, and which are tied to the vertical pieces wherever they intersect them. As it would be difficult to tie the ropes that bind the scaffold together sufficiently tight, wedges are driven between them and the poles. The platform for the workmen, and most of the cross-bars by which it is supported, are raised as the work advances, and the holes left in the walls to receive their ends are filled in with a brick or half brick. When the height of the building exceeds that of the vertical poles, a second set is added, their lower ends coming several feet below the tops of the first series, to which they are firmly bound with cords. These additional poles are, like the former, strengthened by horizontal and diagonal pieces, and tied to the wall at intervals by the cross-pieces that sustain the platforms, some of which are allowed to remain till the completion of the work, for that purpose. In this way a scaffolding may be carried up to any required height, each set of vertical poles being tied to that immediately below it. Ladders are used to afford access to the platforms, of which, in some stages of the building, there are several; and bricks and mortar are usually carried up in hods on the shoulders of workmen, but occasionally in baskets raised by a rope which passes over a pulley at the upper part of the scaffold. When such a scaffold is erected in a public thoroughfare, the lower part of the poles should be whitewashed, to render them visible at night; and hoards should be erected to protect passengers and carriages from inconvenience and danger. London builders frequently enclose the whole of the footpath with their hoards, and make a temporary path of planks outside them. But sometimes, instead of diverting the footpath, a covered way is made under the scaffold for foot passengers; the boards forming the top of which should be strong enough to allow ladders to be planted upon them, and to bear the shock of anything falling on them from above. The planking at the sides of the covered way should be inside the timbers, that there may be no projections to injure passengers. The general use of such covered ways might involve some additional expense; but, as the timber-work might be easily removed from one scaffold to another, the cost would probably be immaterial, while the convenience to the public would be much greater than in the ordinary method.

In the erection of important buildings of stone, a very convenient kind of scaffold has been recently adopted, consisting of large squared timbers well framed together, and terminating at the top in horizontal beams. Such a framing is erected on each side of the wall, unconnected with it, and rails are laid on the top beams, on which runs a carriage, capable of being moved by means of a winch-handle connected with the wheels. The carriage itself consists of a frame supporting another railway at right angles with that on which it runs; and on the upper railway is a smaller carriage, which supports tackle suitable for raising the stones. By this arrangement a stone may be lifted up, and moved, by the combined action of the two railways, to any point required on the wall.

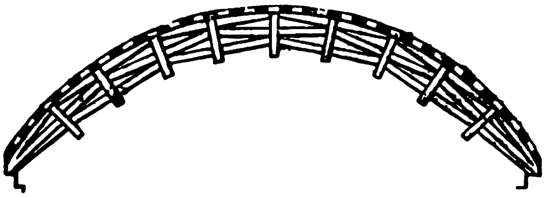
It does not fall within the scope of the present work to enter minutely into the varieties of scaffolding used under different circumstances. The centering of arches, an account of which was omitted under CENTERING, is however a kind of scaffolding that claims particular notice.

The centering (or centreing) of an arch is the wooden support or mould on which it is formed. It is required to be of great strength, not only on account of the great weight which it has to sustain before the arch is closed in, but also because of the unequal manner in which the load presses at different stages of the work. A centre usually consists of a number of distinct frames, resembling the trusses of a roof, placed equidistant from each other in vertical planes, and covered with a series of planks or beams of timber called bridging-joists, laid at right angles with the frames or trusses. This boarding or covering of bridgings forms a convexity coinciding with the internal concavity of the intended arch. The trusses of the centering may be from three to about eight feet or more apart, according to the weight of the arch and the strength of the covering on which the stones immediately rest. For small arches the centering is usually covered with planks; but in large works bridging-joists, one laid for each course of arch-stones, are preferred, these being kept at the proper distance apart by blocks placed between them. In the latter case however the arch-stones do not always rest immediately upon the bridging-joists; planks of soft wood being sometimes interposed between them, in order that, by cutting away the planks, the arch may be made to take its own bearing without lowering the centre. The whole structure is stiffened by cross-bars to keep the trusses equidistant and parallel to each other.

When the arch is to be built over a small stream, with a good bottom from which intermediate supports may be obtained by piling, or in other cases in which it is not necessary to maintain a free passage under the centering, its construction is a simple matter. Even where the span is large, and no support can be obtained, except at the piers, centering may be constructed on the principles of trussing which are treated of under ROOF, provided that it be not necessary to leave a free passage for vessels under the arch. But when a bridge is built over a navigable river, horizontal ties near the bottom of the truss are inadmissible, and much skill is required to construct a strong and inflexible centering. Nicholson, in his 'Architectural Dictionary,' describes several different principles of construction that have been adopted for the trusses or ribs. One consists of a large truss formed of two inclined bars (the thrust being borne by the piers, in the absence of a tie-beam), supporting the centre or crown of the arch, while the intermediate points between the crown and the springing are sustained by smaller trusses resting on the sides of the principal one. In this case the *rafters*, or inclined beams of the main truss, may be used also as tie-beams to the subordinate trusses. In another arrangement a large truncated truss is used to support the haunches, while the crown of the arch is sustained by a small triangular truss resting upon the top of the former. In either case the bars which form the external ring of the trusses, the outer edges of which are of a curved form, are supported at several intermediate points by means of struts abutting on fixed points in the truss.

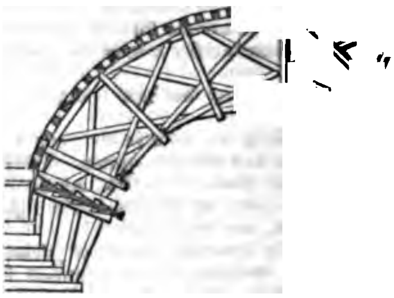
The construction adopted by Perronet, in his celebrated bridges in France, consists of a series of polygons placed within each other; the angles of one polygon bearing against the middle of the bars forming that immediately outside it. *Fig.* 1 represents a centre formed on this principle; the trussing-posts which are added in a radiating position at the joints serving to prevent the angles of the inner polygon from bending the [illegible] abut. In some cases the polygons [illegible] with each other, but each forms a [illegible] arch, the whole being made to act [illegible] of trussing-posts, which are made [illegible] being bolted on each side of the [illegible]

Fig. 1.



Centres of the kind just de[illegible] under the arch, especially [illegible] timbers at the foot of the center[illegible] a narrow base; but they appear t[illegible] in stiffness, having sunk very much [illegible] the building, and required a heavy [illegible] crown to prevent it from being [illegible] the haunches. The kind of c[illegible] in building Blackfriars Bridge, which [illegible] several other important works, is f[illegible] in strength and immutability of [illegible] ment each fixed point of the curve [illegible] ings is supported by two timbers a[illegible] of the arch; each pair of whi[illegible] independent truss. *Fig.* 2, which [illegible] ment, shows that the two timbers su[illegible] not actually meet at their up[illegible] wood, termed an apron-piece, be[illegible] placed

Fig. 2.



In this cut no attempt has been [illegible] of the centering, the object be[illegible] to [illegible] principle on which it is constru[illegible] centre are made to terminate, on each side [illegible] a piece of wood called the upper st[illegible] side of which is formed into a series o[illegible] similar piece, with the inclined planes [illegible] by struts, abutting on steps or offsets [illegible] tween these striking-plates is placed a piece [illegible] formed into a series of wedges, by driving [illegible] in, the centre may be very gradually lowere[illegible] plan much greater stability is obtained than w[illegible] of the centre is contracted so as to bear on one [illegible] each pier; and, when the bed of the river [illegible] still greater firmness and security may be o[illegible] ing piles some distance within the piers [illegible] inner ends of the lower striking-plates. [illegible] halved into each other at their intersecting [illegible] ber of which is perhaps the chief disadvant[illegible] of [illegible] and double king-posts, as in the constructio[illegible] are added to keep the joints firm.

Robison (*Mech. Phil.*) observes, speaking of [illegible] that is supported wholly on the piers, that 'th[illegible] which is to support our arch before the key is [illegible] itself be an arch, depending on the mutual ab[illegible] beams.' This natural principle is acted upon i[illegible] ing represented in *Fig.* 1; and also in anot[illegible] is occasionally used, consisting of a number [illegible] frames abutting on each other like the voussoirs [illegible] the joints radiating from the centre. Each [illegible] fened by diagonal braces; and the whole stru[illegible] bles the *Norman roof* (represented in the [illegible] 147), with the addition of pieces parallel wi[illegible] complete each frame.

The centering of the new London Bridge [illegible] a different plan from any that have been [illegible] greater part of the arch being supported by [illegible] the upper part of which, being formed of a [illegible] pieces abutting against each other, co[illegible] of the arch, and which was stiffened b[illegible] ing-posts, and diagonal braces. This [illegible] such a height as to allow free passage [illegible] by means of a trussed framing on each [illegible] g-plates; and a broad base was obtained for the whole ng.

frequently difficult to ascertain which of the timbers ntre will be exposed to tension, and which to com- n; and some will be subject to both in different of the work; a circumstance for which it is difficult ide securely. As in other kinds of truss, all trans- strains should be avoided, and the joints should be ly secured with bolts and straps. As a general rule, cessary stiffness should be obtained by means of struts than ties, on account of the difficulty of making joints ill bear the immense strains to which centering is ; especially because the temporary character of the ure renders it desirable to cut the timber as little as be, in order to save expense. The centres contrived tish engineers have generally stood very well; but, ne alteration of shape is unavoidable, owing to the ing of the joggles, &c., and as the arch must be ex- to sink a little when the support it derives from the ing is withdrawn, the centre should be made rather at the crown than the curve which the arch is in- l finally to assume, in order that the stones may be in rium.

scarcely necessary to observe that the building of the hould proceed simultaneously on each side, in order id unequal strains on the centering. It is sometimes to load the crown of the centering during the pro- of the work, to prevent it from changing form by the anced pressure of the haunches. When the arch is eted, the removal of the centering is a delicate and im- t operation. Perronet removed its support from the or, in technical language, *eased* the centering, by g away the transverse pieces upon which the stones diately rested; beginning at the abutments and ad- ng equally on each side towards the crown. Another, h a very objectionable plan, of cutting away these pieces alternately, and leaving the arch supported for at a few distant points, has been practised. The best ppears to be, gradually lowering the whole centering taneously by means of wedges, as represented in *Fig.* he rubbing surfaces of the wedges and striking-plates mmonly soaped and rubbed with black lead, or, in works, covered with sheets of copper. While the ng is in progress, blocks are put into the spaces be- he wedges, to prevent their slipping; and when com- l, these blocks being removed, the wedges are driven either with mauls, or, if very large, with a battering- uspended from the centering. The wedges are some- so arranged that they may be struck from the sides bridge, so that the men employed need not be under rch during the operation. The centering is lowered ttle in the first instance, and should not be taken until the arch has completely settled. In most cases esirable to lower the centering as uniformly as possi- but where a tendency to unequal settlement is ob- l in the arch, it may be advisable to ease it irregu- to assist the arch in settling to a firm bearing. For es consisting of several equal and similar arches, two ee centerings may be sufficient, one only being removed e.

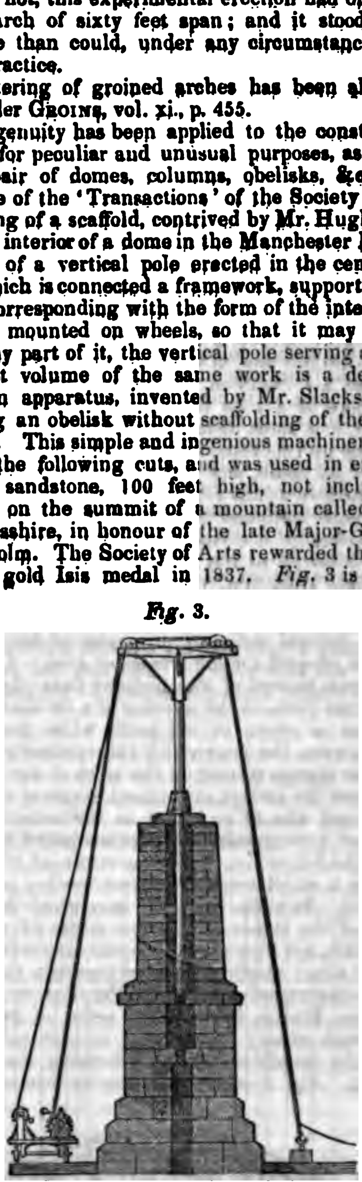
a Report by Telford on the passage of the Menai , printed in the Parliamentary Papers for 1811, a plan is proposed for the centering of very large arches; ially adapted for situations in which, from the nature e bottom, the rapidity of the current, or the great ion of the bridge, a centering put up from below would practicable. It was suggested for the erection of an rch of 500 feet span at Ynys-y-Mooh. Telford pro- that the masonry of the abutments should be carried the level of the roadway, and surmounted by four ve frames, about fifty feet high, placed at the same ce apart that the ribs of centering were to be. The ring was to be formed of a number of trussed frames, together like the stones of an arch; these frames twenty-five feet deep at the sides, and gradually ishing to seven feet six inches at the crown of the The first set of these frames of centering were to be p by means of scaffolding secured to the abutments; upported by horizontal ties set in the masonry, and rods suspended from the frames at the top of the nent. On the first portion of centering thus put up, ring was to be laid, on which the second set of frames be moved forward. These, being laid upon the first set in an inverted position, were to be hinged to them by a contrivance resembling the joint of a carpenter's rule, and then turned over until their ends abutted against the ends of the first set. Suspension rods being then extended from the ends of the second set to the frames on the abutment, the flooring was to be extended, and a third portion of the centering moved forward and fixed in like manner. Thus the centering would be suspended from the abutments; and, when completed, it would have the strength of an arch, as well as that of the suspending rods, to enable it to support the superstructure.

To avoid the expense of centering, Brunel (now Sir Mark Isambard Brunel) invented, a few years since, a method of building brick arches, in which, by taking advantage of the cohesive strength of Roman cement, and the introduction of iron hooping to tie the brickwork together, one half of an arch is capable of supporting itself; no centering being required beyond a slight rib to serve as a model of the curve of the arch. This plan has not, we believe, been applied in practice, but it appeared, from an experimental arch (or rather a pier, supporting parts of two arches), erected near the Thames Tunnel, to be adapted even for large spans. If we mistake not, this experimental erection had one half of a very flat arch of sixty feet span; and it stood a much longer time than could, under any circumstances, be required in practice.

The centering of groined arches has been already described under GROINS, vol. xi., p. 455.

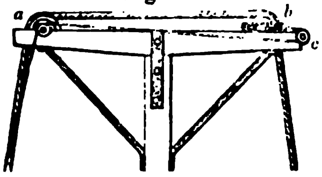
Much ingenuity has been applied to the construction of scaffolding for peculiar and unusual purposes, as the erection or repair of domes, columns, obelisks, &c. In the 31st volume of the 'Transactions' of the Society of Arts is an engraving of a scaffold, contrived by Mr. Hughes, for repairing the interior of a dome in the Manchester Exchange. It consists of a vertical pole erected in the centre of the dome, to which is connected a framework, supporting a kind of ladder, corresponding with the form of the interior of the dome, and mounted on wheels, so that it may be moved round to any part of it, the vertical pole serving as an axis. In the 51st volume of the same work is a detailed account of an apparatus, invented by Mr. Slacks, a mason, for building an obelisk without scaffolding of the ordinary description. This simple and ingenious machinery is represented in the following cuts, and was used in erecting an obelisk of sandstone, 100 feet high, not including the foundation, on the summit of a mountain called Whitaw, in Dumfriesshire, in honour of the late Major-General Sir John Malcolm. The Society of Arts rewarded the inventor with their gold Isis medal in 1837. *Fig.* 3 is a general view of the apparatus, the obelisk being shown in section, and *Fig.* 4 an enlarged representation of the upper part.

***Fig.* 3.**



The obelisk is hollow, having bond-courses throughout at intervals, in which holes of ten inches diameter are left to receive the lower part of a pole, forty feet long and ten inches in diameter. At the point where the pole passes through the upper bond-course it is surrounded by a collar of hard wood, firmly bolted to it; which, resting on the bond-course, supports the whole apparatus, while the lower bond-courses, by embracing the pole, hold it in a vertical position. To enable the pole to turn round with facility, seventeen balls, three inches and a half in diameter, are placed between the collar and the stone, each of which has a circular groove to receive the balls and guide them in the right direction. At the top of the pole a cross-piece, about twelve feet long, is fixed, and secured to the pole by iron braces. Each end of this cross-piece carries a grooved pulley, that at *a* (*Fig.* 4) being inserted in a mortice cut in the beam, while that at *b* is mounted on a small carriage, capable of rolling nearer to or farther from the centre, upon rails fixed on the top of the beam; a long groove or mortice being cut through the beam to receive the lower part of the pulley. A circular railway is laid round the base of the obelisk, on which is placed a carriage, containing a crab, or machine for winding up the rope. The rope, by which the materials and workmen are raised, passes up from the crab over the pulleys *a* and *b*, and down to the ground on the opposite side, where the stones are attached to it, their tendency to swing against the obelisk being checked by a guy or guide-rope held by a man on the ground. The natural effect of the weight raised is to make the pulley *b* approach the centre of the cross-beam, but this tendency is so regulated as to cause the stone to descend upon any required spot, by attaching a small rope to each side of the carriage in which *b* is mounted, which, passing round a small pulley at *c*, and over another on the axis of *a*, is carried down to a small windlass mounted on the same carriage with the crab. There is a rope of this kind on each side of the beam, but, at a short distance below it, the two are united. By winding up this rope, the pulley *b* is caused to approach the end of the beam, and by fixing the windlass it may be made stationary at any required point.

Fig. 4.



For a more particular account of this apparatus, and the means by which it is elevated from one stage to another, the reader is referred to the volume mentioned above, or the 'Mechanic's Magazine,' vol. xxix., pp. 225-230. The contrivance for finishing the top of the obelisk must however be mentioned here. When the first sloping course of the apex was laid, a light hanging scaffold, represented in *Figs.* 5 and 6, was laid upon it. The first cut represents the scaffold in profile, while the second is a ground-plan.

Fig. 5.

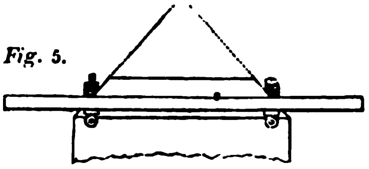
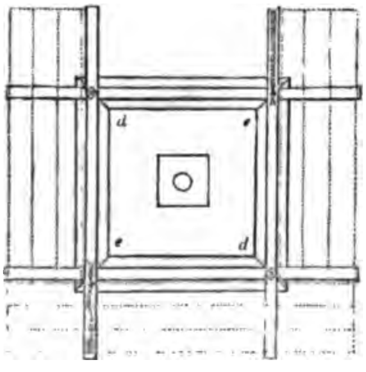


Fig. 6.



The scaffold consists of four pieces of wood, twelve feet six inches long, formed into a frame, the inside of which fits and rests upon the sloping stones. At the angles *d*, *d* these timbers are fixed together by screw-bolts, and at *e*, *e* by slip-bolts with their points upwards. [illegible] ed to [illegible] from falling through. This fra[illegible] guy-ropes from the ground, a floor [illegible] dotted lines in *Fig.* 6) was laid on [illegible] of its [illegible] sides, and a pulley fixed on the fourth. The [illegible] to complete the apex in the form indicated [illegible] lines in *Fig.* 5 being then hoisted up, the up[illegible] sawn off to the level of the upper course of st[illegible] portion cut off being lowered by the pulley, [illegible] der left in the obelisk. When the work was [illegible] planks were lowered by the rope and pull[illegible] attached to the slip-bolts at *e*, *e*, and o[illegible] which they were secured. The last pe[illegible] and the ropes attached to the keys and [illegible] sively pulled, the frame was disjoint[illegible] the ground. The ropes for withdrawi[illegible] were passed through blocks at the [illegible] and thence conducted to a safe distance; [illegible] rangements, which it is unnecessary [illegible] made for the safety of the persons [illegible]oyed.

A kind of portable scaffold, or 'travelling platform,' which may prove useful in some situations where support can be obtained from above, was rewarded by the Society of Arts in 1839. It consists of two boards, twelve inches long and four wide, hinged together, with the joint upwards. Grooves are made in the inner edges of the boards, of such a size that a rope suspended from a point above that at which the platform is to be used, will pass through the opening formed by them when the boards are not pressed upon, but will be grasped tightly when the joint is closed by a weight on the boards. These boards are strapped to the feet of the climber, who has a belt round his waist connected with a ring that slides up and down the rope. He draws himself up by his hands, the rope slipping between the boards as he ascends; but as soon as his weight rests upon the boards, they close upon the rope so tightly as to enable him to remain stationary at any point, leaving his hands at liberty.

SCAGLIO'LA (from the Italian *scaglia*, a scale or chip), is an *incrustation* of artificial composition which is applied to columns, and produces the most perfect imitation of marble, from which it can hardly be distinguished either to the eye or the touch, as it takes an equally high polish and feels equally hard and cold. Scagliola has long been in use in Italy, where, according to Lanzi, it was invented by Guido Fassi of Carpi (1584-1649), and where it was afterwards much used for Florentine or inlay-work of the kind called *a commesso*. It was not introduced into this country before the latter half of the last century, and the earliest appearance of it was in the columns of the Pantheon in Oxford-street, London, built by James Wyatt. Since that time, it has been brought into more general use, the manufacture of it has been considerably improved, and it can be executed at a comparatively moderate cost. In fact it has now almost superseded the use of coloured marbles for columns and other interior decorations, and has been extensively employed in Buckingham Palace and many of the club-houses in London. It is far less costly than any kind of variegated marble, though too expensive to be brought into ordinary use on every occasion, and it answers the purpose of the real material not only as regards appearance and effect, but durability also, since it will last quite as long as any other part of the interior of a building. There is besides one great advantage attending it, that columns incrusted with scagliola are generally of wood and hollow, or else filled with a plaster core, and consequently do not require that support in the floor beneath them which would be necessary if solid marble shafts were employed; and if required to support a bearing above them, the columns may be made of brick or ordinary stone, and afterwards coated with scagliola. Nor is the use of this composition confined to columns and pilasters only, for it may be and indeed is applied to other ornamental purposes, for table-slabs, pedestal-stands, dados of rooms, borders of floors, &c.

The composition or cement itself is prepared from the purest gypsum, which is first broken into small pieces, and after being calcined is reduced to powder. It is then passed through a fine sieve, and mixed with Flanders glue, isinglass, &c. In this state it is mixed up with colouring matter of the hue required; and as it is generally employed for the imitation of variegated or veined marbles (all coloured ones being more or less so), as many different colours and shades of the same colour must be mixed up separately as there are in the kind of marble to be imitated. Thus prepared, the composition is applied to columns or other surface intended to receive it, and which has a rough coating of lime and hair. The different colours are laid on and mixed by the workman, and consequently much depends upon his skill and taste in regard to the exactness of the imitation or the beauty of the veining and streaking, which is done in the floating, as it is termed, or laying on the cement. The next operation is to prepare the surface for polishing, by rubbing it with pumice-stone and cleansing it with a wet sponge. The polish is then given by rubbing it again, first with tripoli and charcoal on a piece of fine linen, secondly with felt dipped in tripoli and oil, and lastly with oil alone. By this means a durable lustre is obtained fully equal to that of the finest and most highly polished marble.

When scagliola was first introduced into this country, it was executed by Italian artists, and much secresy was observed in regard to all the processes; but it has since been brought to far greater perfection here than on the Continent, where it is regarded merely as a substitute for marble, and secondary even to such as is of inferior kind or has very little beauty in itself. By means of scagliola, not only may the costliest and rarest stones, porphyry, verde antico, giallo antico, &c. be successfully imitated, but any combination of colours may be produced; for instance, purple, or emerald green, streaked with gold, Siena veined with purple, or any other splendid caprice that fancy may dictate.

SCALA, DELLA, or SCALI'GERI, the name of a family of Verona, which acquired sovereign power over its native city in the thirteenth century, and afterwards extended its dominion over the neighbouring towns and territories. Like the Della Torre and the Visconti of Milan, the Della Scala belonged to the order of the nobility. They became party leaders during the factions which agitated the Italian cities in the middle ages, and their party having proved successful, they obtained the dignity of Podestà, or supreme magistracy, first for a term of years, afterwards during the life of the holder, and lastly as an office hereditary in their family, being confirmed in it by the sanction of the German emperors, who, in their quality of kings of Italy, although they had no direct dominion over any part of the country, appointed as their imperial vicars those chiefs who had most influence over their countrymen. [Lombardy and Lombard Cities.]

After the death of Eccelino da Romano, tyrant of Padua, Verona, and Vicenza, and the great Guibeline leader in Northern Italy, the people of Verona elected for their podestà Mastino della Scala, about the year 1260. Mastino belonged to the Guibeline party, which predominated at Verona. After having held office for five years, during which by his conduct he won the public approbation, Mastino was made by acclamation perpetual captain of the city. Being murdered by some private enemies in 1273, the citizens elected for his successor his son Albert, who was afterwards proclaimed lord of Vicenza, Feltre and Belluno, by the citizens of those towns.

Albert died in 1297, and was succeeded by his eldest son Bartolommeo, who, dying three years after, was succeeded by his brother Alboino, a man of a peaceful temper, who, not thinking himself fit to rule alone in those turbulent times, took his younger brother, Can Francesco, a brave aspiring soldier, for his colleague, and some years later resigned to him the undivided sovereignty. Can Francesco della Scala, called 'the Great' by his contemporaries, was the most illustrious of his family. He was appointed captain of the league made by Verona, Mantua, Brescia, and other towns against the marquis of Este, lord of Ferrara, who, being supported by the Anjous of Naples, aspired to extend his dominion over Lombardy. Can Francesco defeated him, and obliged him to withdraw to Ferrara. When Henry of Luxembourg, king of the Germans, came to Italy to be crowned emperor, in 1311, Can Francesco joined him with a body of troops, and assisted him in subduing Brescia and other towns which would not acknowledge the imperial authority, and he was rewarded by Henry appointing him his imperial vicar at Verona. Can Francesco, or Can Grande, as he was henceforth styled, became the acknowledged head of the Guibeline party in Lombardy, like his contemporary Castruccio Castracani in Tuscany. The dominion of Can Grande extended over Verona, Vicenza, Feltre, Belluno, Este, Monselice, Cremona, and lastly, after a war which lasted several years, also over Padua, in short over almost the whole extent of country which has been since called the Venetian territory, Venice at that time having but a strip of ground on the mainland bordering on the lagoons. The last acquisition of Can Grande was that of Treviso, which he obliged to open its gates to him in July, 1329 He made his triumphal entrance into Treviso, but was a few days after seized by a violent fever and died in the height of his success, at the age of thirty-nine, having been ruler of Verona for about nineteen years. Castruccio had died the year before, and thus the Guibelines of Italy lost, nearly about the same time, their two most distinguished leaders.

Can Francesco della Scala acquired celebrity not only by his success as a warrior and a statesman, but by the encouragement which he gave to literature and the arts. His court, which was very splendid, was attended by poets, painters, and sculptors. Dante, in his exile, found for a time an asylum at the court of Della Scala, and he immortalised Can Francesco in his verse. Boccaccio also wrote of him as one of the most illustrious chiefs that Italy ever had, not only on account of his bravery in the field, but also for his abilities in council. He raised the fortress of Peschiera, on the shore of the lake of Garda, as a defence on the side of Mantua and Milan.

Can Francesco was succeeded by his two nephews Alberto and Mattino, who acted a conspicuous part in the wars of the Italian factions in the fourteenth century, fighting against the Visconti and the Venetians. Their descendants continued to rule till the year 1387, when Gian Galeazzo Visconti, duke of Milan, took possession of Verona, having driven away Antonio della Scala, an illegitimate son of the last lord. After some more vicissitudes Verona came into the possession of the Venetians, in the year 1409.

SCALA, Klein's name for the *Scalaria* of authors.

SCALA'RIA. [Wentletrap.]

SCALARIANS, Lamarck's name for a family of testaceous mollusks, which he arranges in the first section of his order Trachelipoda. The *Scalarians* of Lamarck consist of the genera *Vermetus*, *Scalaria*, and *Delphinula*.

SCALD. [Burns and Scalds.]

SCALD, properly SKA'LLD, is an antient Scandinavian word which signifies poet, as skålldmär or skålldkona signifies a poetess. The name is therefore sometimes applied to the Scandinavian poets in general, but it belonged more especially to that class of poets who celebrated in their songs the exploits of heroes. The Scalds were thus not merely poets, but also the historians of their nation. When Snorri Sturluson, the last and most celebrated of the Scalds (1178-1241) states that the Scalds indeed always praised their contemporary heroes most, but never attributed to them any fictitious deed, we must infer that the creative powers of these poets had no scope, at least as far as contemporaneous history was concerned. In the history of the past they might take greater liberties; but we have reason to believe that even here they strictly adhered to tradition. The form and mode of diction were thus the only parts in which they displayed their poetic powers; and how they availed themselves of this right is clear from the numerous specimens of Scaldic poetry still extant: they are full of the boldest and most extraordinary imagery, whence they are frequently very obscure and almost unintelligible.

Scaldic poetry is almost the only source from which we derive our knowledge of the antient history of the North of Europe. A considerable portion of it goes back to the remotest antiquity, and contains only mythological legends; while another portion, in the form of poetry, contains historical accounts of contemporary events. Such poetical histories, very different from the rhymed chronicles of other nations, continued to be written down to the middle of the thirteenth century. The Scalds were generally in the service of a chief or king, whom they accompanied on his expeditions in the capacity of historiographers; and it was the pride of the chieftains to obtain such Scalds as possessed most ability and learning. Their services were richly rewarded by the heroes whose praise they sang.

We still possess a very long list of Scalds, among whom are persons of the highest rank, and even kings. The most distinguished however were those of Iceland, and it is to these that we are indebted for the collection of antient poetical traditions known under the name of the Eddas. Compare 'Fundgruben des Nordens,' vol. i.; John Olafsen, 'Om Nordens gamle Digtekonst, Grundregler, Versarter, Sprog og Fóredrags mode,' Copenhagen, 1786; F. Wachter, in the introduction to his German translation of Snorri Sturluson's 'Heimskringla;' and the article Snorri Sturluson.

SCALE (Music). A great deal has been written on this subject, by mathematicians, by musicians, and by those who combined both characters; but, from various circumstances, hardly anything which is accessible to the young arithmetician wishing for something which may really be a help to him in his musical studies. The Greek scale [MUSIC; TETRACHORD], the only fruitless subject of inquiry out of all that is Greek, has exhausted the learning, science, and ingenuity of the best writers, with no result but this, that over-refinements of theory are found either to have hindered practical excellence, or to have arisen out of the want of it; most likely the latter. The learning however which it was necessary to apply to the explanation of the Greek writers, has made it usual to write on this subject more profoundly than on others of the same difficulty: it is an object in the present article to explain the musical scale, if possible, more simply, and in its simplest parts: leaving to the article TEMPERAMENT such considerations as, arising out of the present article, are required by those who would understand the higher practical details of the subject.

The object of music being to please the ear, or the mind through the ear, there is no other test of excellence nor criterion of fitness, in any one detail, except the opinion of the best judges. This seems to assume the question, for the best judges can only be described as those who best know what is good music. This circle cannot be avoided, either in speaking of music or any other of the fine arts; to taste we must appeal, but not to the taste of every one. All we have here to do with this is to remark, that the mathematical considerations employed in an article like the present are not to be considered as placing the musical scale upon a mathematical basis, but simply as showing that there is something like an explanation of those rules, which derive their authority not from the mathematical system which embodies them, but from the sanction of the majority of cultivated ears. Those things which are agreeable in practice are found to be in certain mathematical relations to one another which make the theory of the musical scale simple and interesting: but had it been otherwise, we should have left mathematical simplicity, and preferred a more pleasing complexity.

The sounds which are agreeable to the ear are found to be those which are the consequence of vibrations of equal duration following one another. [ACOUSTICS.] The note called A, for instance, sounded at the same time on a harp, a flute, and a horn, presents three different characters, three different intensities, but only one species of vibration as to the time of lasting. If the first instrument communicate 430 vibrations in a second to the air, so does the second instrument, and also the third. With the difference of intensity or loudness, and with the difference of character, the twang of the harp, or the tone of the horn, we have nothing to do in considering the place in the scale of the note they sound: a cultivated ear discovers that they sound the same note, and a mathematician knows that they severally communicate to the air the same number of vibrations per second.

Let us then suppose a string to be mounted, and stretched at both ends, or, better still perhaps, suspended vertically* by one end, and bearing a weight at the other. If this string be then set in vibration by the finger or by the bow of a violin, a musical (that is, a pleasant) sound is produced, if the string be not too long, nor stretched by too small a weight. With the phenomena of vibration, as connected with the length, material, and stretching weight of the string, we have here nothing to do [CORD] except to remark,—1, That the ear observes that, material and tension remaining the same, the longer the string the lower the tone, and *vice versâ*. 2, That the mathematician knows that, *ceteris paribus*, the longer the string the fewer the number of vibrations in a given time, in inverse proportion to the length. Thus, if a certain string, stretched by a certain weight, give 100 vibrations per second, a string of half the length, stretched by the same weight, will give 200 vibrations per second. If a vibration mean a double motion of the string, once backwards and once forwards, the effects begin to be musical soon after the string is short enough, or stretched enough, to give 30 vibrations per second.

The number of musical tones is, theoretically, infinite: that is, between any two tones as many [illegible] we please can be interposed, no one of which [illegible] higher, nor so low as the lower. Hi[illegible] tone are terms which are purely [illegible] effect upon the ear which does [illegible] common terms usually distinguish only [illegible] thus, a tone disagreeably high is a [illegible] agreeably low is a growl. There is [illegible] why we should call the former high [illegible] rather than the contrary; and in fact [illegible] (naming them after the parts of the [illegible] thought they were produced) called th[illegible] low, and the growling ones high. But [illegible] to separate names from things, we [illegible] there is much which all men acl[illegible] nexion between the associations wh[illegible] and those derived from other sensi[illegible] instance, it would be impossible to pe[illegible] if light and darkness were to be imitat[illegible] the light ought to be represented by [illegible] darkness by high notes: and a c[illegible] company words expressive of tran[illegible] light by a marked descent from [illegible] scale to the lower, would be the[illegible] burlesque. No satisfactory explan[illegible] our knowledge as to what associati[illegible] lower notes of the scale which connect [illegible] but that this connexion does exist is [illegible]

Taking such a string or monoch[illegible] above described, it is immediately f[illegible] of its length produces some alteration [illegible] change be very slight, a dull or unpr[illegible] readily perceive it; but let the alteration [illegible] further, and there can be no difficulty. [illegible] to one another, when sounded together, h[illegible] and jarring effect, accompanied by b[illegible] [A[illegible] 97]: but when the second string [illegible] shortened (say that this is done gradually), th[illegible] effect ceases almost at once, and at the [illegible] shortened string is to the longer one as [illegible] sounds are then heard which *harmonise* t[illegible] their joint effect the ear dwells with ple[illegible] comes monotonous (this very common [illegible] as to its common signification here [illegible] ing effect of the same tone, or set of t[illegible] In the mean while, and during the sho[illegible] the joint effect, though always disagr[illegible] so throughout; and there is one place [illegible] the effect, though not agreeable to the beg[illegible] for a little while, and highly agreeable to the [illegible] which knows that full compensation is at hand [illegible] called the resolution of the discord, or [illegible] harmonious combination in a manner [illegible] liarly natural. This intermediate and [illegible] of sound takes place when the shortened [illegible] other as eight to nine. Moreover, it may [illegible] this last combination, hardly bearable, is [illegible] so if the two tones, instead of being sound[illegible] made to follow each other in succession, no[illegible] rapidly. In both these cases the student will [illegible] the proportion of the lengths of the strings is [illegible] small numbers, five to six, and eight to nine. A[illegible] matter of experiment, that the more simple the proportion of the lengths of two strings (stretched by the same weight) the more useful the combination in music—it is used [illegible] say the more agreeable sounded by itself; but to this [illegible] cannot subscribe, as we believe that to most ears the more complicated combination of a *third* (presently to be described) is more agreeable than the less complicated one of a *fifth*.

Instead of speaking of the lengths of the strings, we may pass to the relative numbers of vibrations in a second, which are inversely as the lengths. Thus, two strings [illegible] ten and seven feet, stretched by the same weight, vibra[illegible] so that the one of ten feet makes eight vibrations wh[illegible] that of eight feet makes ten.

We now proceed to consider the most simple combinations; and first, that of two to one. Let the second string be half the first, or make two vibrations while the first makes one: there is then not only a joint effect wh[illegible] is agreeable, but a peculiar sameness of the two notes in so much that two instruments made to play together in such manner that the notes of the second shall always e of twice as many vibrations as the simultaneous notes f the first, would be universally admitted to be play- the same air, with no more difference than of that which is heard when a man and a boy attempt to ing the same air together. This perfect sameness, for so t will be called, though the two instruments never sound he same tone together, admits of no explanation; for hough the ratio of the simultaneous vibrations is the implest possible (two to one), there is no perceptible eason why, because simple ratios generally give harmo- ous combinations, the most simple of all should produce n absolute feeling of identity of character in the two tones. o this circumstance however we owe the most material implification of the musical scale: for let it be settled, for nstance, what strings give agreeable notes between those f 20 and 10 feet long, and division by two will give all the trings which can be admitted between those of 10 and 5 eet: thus, if it be proper to admit a string of eight feet in he former set, one of four feet must also take its place in he latter.

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* Woodhouse 'On Musical Intervals,' p. 64. The author repeated the experiments of Fischer [Acoustics, p. 97] and found a monochord thus constructed better than the common one for the purpose. His result was that A (the second space of the treble clef) made 424 vibrations in one second.

Again, it is observed that the relative effect of two tones s always the same as those of other two, when the numbers f vibrations made in a given time in the first pair are *n the same proportion* as the corresponding numbers in he second pair. Thus, suppose that in a given time the umbers of vibrations made by four strings are 12, 18, 40, nd 60. Then,

$$12 \cdot 18 :: 40 : 60 \text{ or } \tfrac{18}{12} = \tfrac{60}{40}$$

nd we may say that, according as the first and second ounded together are pleasant or unpleasant, so are the hird and fourth; also if an air beginning on the first string equire an immediate transition to the second, then the ame air begun on the third string will require an imme- iate transition to the fourth.

A *musical interval*, then, is given when the fraction hich expresses the proportion of the vibrations of its two otes in a given time is given. By the interval $\frac{3}{2}$ we mean hat of two notes, the higher of which makes three vibra- ions while the lower makes two. Thus, if 18, 23, and 30 e the numbers of vibrations made by three strings in the ame time, and we wish to find a fourth note which is as uch above the third as the second is above the first, we ust not make a string of 35 vibrations in the same time as the beginner might do), that is, not one of 30 + 23 — 18, ut one of 30 × $\frac{23}{18}$, or $38\frac{1}{3}$ vibrations in the same time.

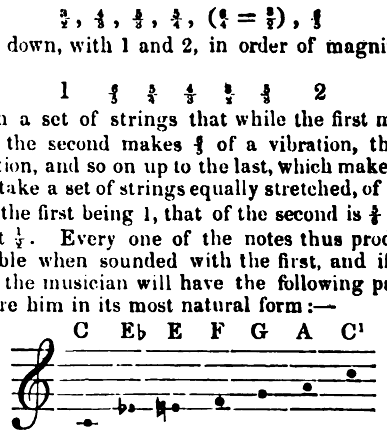
Let us now take a string, and call the note sounded by it , and let the string of twice as many vibrations (or half ts length) have the same name, with a difference (for the eason above given); call it C¹. Let us now seek for the implest fractions which lie between 1 and 2. Take the umbers up to 6 (the ear does not so well agree with 7 and ll higher prime numbers, why of course cannot be told, ut simplicity must end somewhere, and, by the constitution f the ear, ratios in which 7 and higher primes occur are ot agreeable), and form every fraction out of them which ies between 1 and 2; we have then

$$\tfrac{3}{2},\ \tfrac{4}{3},\ \tfrac{5}{3},\ \tfrac{5}{4},\ (\tfrac{6}{4} = \tfrac{3}{2}),\ \tfrac{6}{5}$$

ut these down, with 1 and 2, in order of magnitude, and e have

$$1 \quad \tfrac{6}{5} \quad \tfrac{5}{4} \quad \tfrac{4}{3} \quad \tfrac{3}{2} \quad \tfrac{5}{3} \quad 2$$

ake such a set of strings that while the first makes one ibration the second makes $\frac{6}{5}$ of a vibration, the third $\frac{5}{4}$ f a vibration, and so on up to the last, which makes 2 vibra- ions: or take a set of strings equally stretched, of which the ength of the first being 1, that of the second is $\frac{5}{6}$, &c., and f the last $\frac{1}{2}$. Every one of the notes thus produced will e agreeable when sounded with the first, and if the first ound C, the musician will have the following part of the cale before him in its most natural form:—



hese intervals have the following names; why, will pre- ently be seen,—

$\frac{6}{5}$	minor third.	$\frac{3}{2}$	fifth.
$\frac{5}{4}$	major third.	$\frac{5}{3}$	major sixth.
$\frac{4}{3}$	fourth.	2	octave or eighth.

We have not yet, however, got a sufficiently agreeable scale, and the reasons why the ear will not be contented with the preceding most simple concords, must be derived from observation, from which it appears—

1. That a frequent repetition of sounds very near to one another is not pleasing to the uncultivated ear. Now the interval from the minor to the major third is as follows: the first makes $\frac{6}{5}$ of a vibration while the second makes $\frac{5}{4}$, or the first makes 1 vibration while the second makes $\frac{5}{4} \times \frac{5}{6}$, or $\frac{25}{24}$. This is much too near to a unison for continual repetition.

2. That a frequent repetition of sounds too far from each other is not pleasing to the ear, after a little cultivation. If we look at the intervals from the fourth to the fifth, and from the fifth to the sixth, we find $\frac{9}{8}$ and $\frac{10}{9}$ for their representatives, while from the fundamental note to the minor third, and also from the sixth to the octave, the interval is $\frac{6}{5}$, much larger than the preceding intervals.

Both these defects, as must easily be seen arithmetically, and as the ear finds out for itself, may be remedied by inserting a note between C and E in place of E♭, which shall make a better division of the interval C E, and by placing an additional note between A and C¹. But how are we to choose these additional notes? If we cannot have any more very simple consonances with the fundamental note, we must take those tones which make the simplest consonances with other notes, and the more they make the better. We have already a repetition of some consonances; for instance,

Interval F C¹ is $2 \div \frac{4}{3} = \frac{3}{2}$, or a fifth.
Interval G C¹ is $2 \div \frac{3}{2} = \frac{4}{3}$, or a fourth.
Interval F A is $\frac{5}{3} \div \frac{4}{3} = \frac{5}{4}$, or a major third.

Now since $\frac{9}{8} \times \frac{4}{3} = \frac{3}{2}$, we see that a note $\frac{9}{8}$, or one which makes 9 vibrations while the fundamental note C makes 8, will be a fourth below G, and $\frac{9}{8}$ divides C and E well, the three notes $1, \frac{9}{8}, \frac{5}{4}$, giving the intervals $\frac{9}{8}, \frac{10}{9}$, already found in another part of the scale. This note is D. Again, observe the interval from E to F, or $\frac{16}{15}$, and take a fifth above E, or $\frac{5}{4} \times \frac{3}{2}$ or $\frac{15}{8}$: this fraction falls between $\frac{5}{3}$ and 2, and looking at the intervals of $\frac{5}{3}, \frac{15}{8}$, and 2, we find $\frac{9}{8}$ and $\frac{16}{15}$, both of them intervals already found. This note $\frac{15}{8}$, or which makes 15 vibrations while the fundamental note makes 8, is B, and the usual scale of civilized nations, called the *diatonic* scale, is now complete in the following—

C	D	E	F	G	A	B	C¹
1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2

This diatonic scale seems then to be the scale of the simplest concords of the fundamental note, with one alteration on account of the too great proximity of two concordant notes, and one interpolation on account of the too great distance of two others. If we examine all its intervals, we shall find both repetition and variety as follows (C D standing for the interval from C to D, &c.), some new appellations being added:

CD = FG = AB . . = $\frac{9}{8}$ (major tone).
DE = GA . . . . = $\frac{10}{9}$ (minor tone, $\frac{80}{81}$ of major).
EF = BC¹ . . . . = $\frac{16}{15}$ (diatonic semitone).
CE = FA = GB . . = $\frac{5}{4}$ (major third).
EG = AC¹ . . . . = $\frac{6}{5}$ (minor third).
DF . . . . . = $\frac{32}{27}$ ($\frac{80}{81}$ of minor third).
CF = DG = EA = GC¹ = $\frac{4}{3}$ (fourth).
FB . . . . . = $\frac{45}{32}$ (flattened fifth).*
CG = EB = FC¹ . = $\frac{3}{2}$ (fifth).
DA . . . . . = $\frac{40}{27}$ ($\frac{80}{81}$ of fifth).
CA = DB . . . . = $\frac{5}{3}$ (sixth).
EC¹ . . . . . = $\frac{8}{5}$ (minor sixth).
CB . . . . . = $\frac{15}{8}$ (seventh).*
DC¹ . . . . . = $\frac{16}{9}$ (flat seventh).†
CC¹ . . . . . = $\frac{1}{2}$ (octave).

We observe here the consonances mentioned before, two inharmonious intervals, a new species of consonance (the flat seventh) standing as it were between the more perfect consonances and the others, and new varieties of a tone, of a minor third, and of a fifth, differing from those already described, and flatter by the interval $\frac{81}{80}$. This interval is called a *comma*, and though the ear can distinguish a difference between the tones of two strings, one of which vibrates 81 times while the other vibrates 80, yet the difference is so slight as to produce no prejudicial effect. With regard to the comparatively harmonious character of the flat seventh, observe that $\frac{16}{9}$ is very nearly equal to $\frac{7}{4}$, differing only by the interval $\frac{64}{63}$.

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* An inharmonious interval, when the notes are sounded together.

† Decidedly more harmonious than the seventh.

We have also the diatonic semitone, $\frac{16}{15}$, which is incorrectly named, since, if beginning with 1, we repeat the interval of a semitone twice, we have $\frac{16}{15} \times \frac{16}{15}$, or $\frac{256}{225}$, which is very near to $\frac{8}{7}$, sharper (that is, higher, as flatter means lower) than a major tone by the interval $\frac{64}{63}$ and than a minor tone by $\frac{36}{35}$, very nearly.

We shall presently resume the diatonic scale, but we now proceed to mention two varieties of it. It seems to have been offensive to the ears of rude nations to hear any semitones at all. If we deprive the diatonic scale of F and B, the notes which rise semitones at the next step, we have C, D, E, G, A, C, for all the sounds which remain in the octave. This unfinished scale, as we should call it, is the original scale of the Chinese, Avans, Hindus, and Eastern Islands, the northern nations of Europe, &c. It is the well-known scale of the old Scotch and Irish music; it is said to have been found in Wales and Cornwall, in various parts of Africa, and even in old Italian music. The Chinese, who never change, have preserved it in absolute perfection, though the modern form of most antient airs in other countries has been relaxed. We copy the notes of a Chinese air given by Laborde:

DCCGAGGCCAGEDCCGAGAACECAGGCCAGECCEDAC

It will be observed that F and B never occur. An almost perfect specimen of this scale occurs in the Scotch air 'The Campbells are coming.' The effect of the scale may be tried by playing *ad libitum* on the black keys of a pianoforte.

The other scale which we have here to mention is that known by the name of the *minor* scale, the common diatonic scale being for distinction called *major*. It may easily be observed that the intervals of the minor third and minor sixth have a sad, or at least plaintive effect, as compared with the major third and major sixth. No explanation can be given of this: perhaps the effect of musical intervals is governed in some degree by associations derived from the human voice in speaking. All persons, except perhaps schoolboys reading what they do not understand nor care about, are constantly, whether they know it or not, varying the tone in which they speak, and making intervals which are very nearly musically correct: and the effect of sorrow, regret, fatigue, &c. is to make those intervals minor. Any person of a quick musical ear who will watch the method of saying the simple words 'I cannot,' pronounced as a determination of the will, and compare it with the same when it is an expression of regret for want of power, will almost always find such an interval as C F or or C^1 G in the first, and C E♭ or C^1 A in the second; if this be so, it is not surprising that a scale in which minor intervals occupy conspicuous places which in the other scale are occupied by major intervals, should produce those associations which have been alluded to. This is a conjecture merely, for after all nature will take the liberty in art, as in science, of concealing her operations. But this much is certain, first, that the minor scale is more plaintive than the major, and secondly, that all musical composers are acquainted with the fact, from the African women who sung of Mungo Park, 'Let us pity the white man, no mother has he to bring him milk, no wife to grind his corn,' up to the composer of Der Freischütz, with all the power of cultivation and the memory of centuries of art. The change from the minor to the major scale is perhaps the most effective of musical resources, certainly the most powerful of those which are easily understood by ears of the ordinary degree of cultivation. Take as an instance the music of the following words from Oberon:—

Oh-Araby, ble-st Araby, my own, my native land.
Methought I cross-ed the dark-blue sea, and touched a gain thy strand;
And there I saw my father's house, &c.

The intervals with which the voice passes over the hyphens in the first two lines are minor, but in the third line a modulation is made into a major scale, and the composer has skilfully taken care to produce a strong result of the new scale in the first two syllables: the effect of the change is strikingly appropriate.

What is the minor scale? This question has been differently answered by different writers on the theory of music, who severally contend for one or anotl [illegible] *scale.* For ourselves, we are no be[illegible] orthodox scales, or rather we hold every [illegible] character which has been used by good compo[illegible] proved by good hearers. It seems to have b[illegible] that because there is one diatonic major s[illegible] sal consent, therefore there must be one [illegible] minor scale: just as well might it be said, [illegible] iambic trimeter is the one metre of Gre[illegible] there must also be some one other metre [illegible] in the choruses. Fortunately however [illegible] what the musician ought to know, that no [illegible] dictated by any absolute law of taste, and [illegible] best tragedians must be the guide, because [illegible] approval which has been conceded to their w[illegible] ing the same sort of guide, we find in [illegible] of musicians (the unknown authors of natio[illegible] very high authority, included) one major scale and [illegible] minor scales; a thing not more atrociously w[illegible] than the one metre of dialogue, and the v[illegible] metres, of the Greeks. And if, moreover, [illegible] mathematical theory of the scale, we shall find [illegible] equal claims on the score of simplicity of [illegible]

Return to the fundamental note C [illegible] namely—

C	E♭	E	F	G	A	C^1
1	$\frac{6}{5}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	2

Instead of throwing out E♭ as too near to E, let it be the latter which we reject; if we finish this with the D and B of the diatonic scale, we have what is called the common ascending minor scale, the commonness of which we cannot deny upon data, though it strikes us that others are as common, if not more so.

(1)	C	D	E♭	F	G	A	B	C^1
	1	$\frac{9}{8}$	$\frac{6}{5}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{15}{8}$	2

The ear will not very quickly acknowledge this as a minor scale in descent, and for the obvious reason that in going from C^1 to C there is no distinction between the scale and the major scale till we come to E♭: though in the ascent the minor interval occurs early. To remedy this, A and B are both lowered a semitone, or the A is made A♭, a fourth to E♭, and the B is made B♭, a fifth to E♭, which gives

(2)	C	D	E♭	F	G	A♭	B♭	C^1
	1	$\frac{9}{8}$	$\frac{6}{5}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{8}{5}$	$\frac{9}{5}$	2

and this scale reversed is called the common mode of descending the minor scale; but as we also find it used in ascending, we put it down as a second minor scale, both for ascent and descent, observing also that (1) may be, and is, used in descent. Again, suppose we retain the B of the original scale, and lower the A, we have then

(3)	C	D	E♭	F	G	A♭	B	C
	1	$\frac{9}{8}$	$\frac{6}{5}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{8}{5}$	$\frac{15}{8}$	2

a wild and pleasing scale, both in ascent and descent, and employed too, in spite of the wide interval between A♭ and B. Its harmonies, technically speaking, are easier and more natural than those of the common scale, and Schneider ('Elements of Harmony') makes it the principal minor scale, treating all others as incidental deviations: the English translator of Schneider contends for its absolute truth, and asks (justly enough) which scale a composer would take who was converting the air of 'Robin Adair' into the minor key (the original air having the notes G A B C D E), namely, G A B C D E♭, or G A♭ B C D E♭? There can be no doubt that the latter would be preferable, but we might add, that if the composer were required to make two variations in the minor key, he would probably choose scale (1) for his other case. The following minor scales are used, and are agreeable:—

(4)	C	D♭	E	F	G	A♭	B	C
	1	$\frac{16}{15}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{8}{5}$	$\frac{15}{8}$	2
(5)	C	D	E♭	F	G	A	B♭	C
	1	$\frac{9}{8}$	$\frac{6}{5}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{9}{5}$	2

Of all these minor keys, we prefer (3). For an instance of the use of it, take the first part of the air 'Charlie is my darling,' the notes of which run thus, C D E♭ F G C^1 G A♭ C^1 A♭ G C^1, C D E♭ F G C^1 D^1 E^1♭ C^1 D^1 B C^1. It is also the scale used in the first two lines of the air from Oberon, already noticed.

We now come to the extension of the diatonic scale by the interpolation of notes betwen all such notes as are far u t to bear it, which completes what is called the ic scale. There are various ways in which this can . and if notes were only occasionally interposed be- se of the diatonic scale, it would be a subject of vely little importance how it was done. But we now explain what is meant by different *keys* in music. note C having been fixed, and the diatonic scale on an air be composed and written down, say 'Robin ir.' The consecutive notes of the first part of this air, ed in the key of C, that is, in the diatonic scale which C for its fundamental note, are (we have nothing here with the time)

G A B C^1 D^1 E^1, G C^1 A C^1 B D^1 C

us now transpose this, as it is said, into the key of F, is, show how it is to be played in a diatonic scale ng the F of the preceding scale for its fundamental (or note. If all the intervals of the scale were equal, this ld be done by playing as follows:—

C D E F G A, C F D F, E G F

in, to remove this air into the key of A, or into the onic scale constructed on A, we should write (if the in- als were all equal),

E F G A B C C^1, E A F A G B A

we chose to confound the intervals of a major and minor , we should find the second of these (so it happens) cor- , for the intervals of the original air are (m, minor tone; major tone; s, semitone) m M s M m (2 M + 2 m + s) + m + s) (M + s) (M + s) s (M + s) M, and those of second are M m s M m (2 M + 2 m + s) (M + m + s) + s) (m + s) s (M + s) M, which are undistinguish- from each other, if M and m be supposed (as is the too nearly equal to make it worth while to take account eir difference. But the third is s M m M s (2 M + 2 s + m) + m + s) (M + m) (M + m) m (m + M) M, which not agree with either of the other two, nor can do xcept to an ear which cannot distinguish s from m or M. ee what intermediate notes will be wanted, we must truct a diatonic scale on each of the seven notes, which hall now do, putting an equivalent to every note above r below C into the octave between C and C^1, by halving oubling the fraction which expresses its vibrations. over, we express the notes in the diatonic scale on D , D_{ii} D_{iii} D_{iv} D_v D_{vi} D_{vii} and D_{viii}; and so on. Also D stand for an octave below D_{vii}, $_{iv}C$ stand for the an octave below C_v, and so on, the rule being that nd C_n are octaves when m and n together make *nine*. his is well known, if anything of the scale be practi- understood. What we have to do, for instance in ing the diatonic scale on F, is to take $\frac{4}{3}$, the represen- e of F in the diatonic scale of C, and multiply it essively by 1, $\frac{9}{8}$, $\frac{5}{4}$, &c. Our scales then are as vs, putting down under each note gained any note of riginal diatonic scale, or any one of the scales previously ed, from which it differs insensibly little, removing note an octave lower when necessary.

	$_{ii}D$	D	D_{ii}	D_{iii}	D_{iv}	D_v	D_{vi}	D_{vii}
)	$\frac{135}{128}$	$\frac{9}{8}$	$\frac{81}{64}$	$\frac{45}{32}$	$\frac{3}{2}$	$\frac{27}{16}$	$\frac{15}{8}$	$\frac{135}{64}$
		D	E		G	A	B	

	$_{iii}E$	$_{ii}E$	E	E_{ii}	E_{iii}	E_{iv}	E_v	E_{vi}
)	$\frac{25}{24}$	$\frac{75}{64}$	$\frac{5}{4}$	$\frac{45}{32}$	$\frac{25}{16}$	$\frac{5}{3}$	$\frac{15}{8}$	$\frac{25}{12}$
	$_{ii}D$		E	D_{iii}		A	B	D_{vii}

	$_{iv}F$	$_{iii}F$	$_{ii}F$	F	F_{ii}	F_{iii}	F_{iv}	F_v
)	1	$\frac{10}{9}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{3}{2}$	$\frac{5}{3}$	$\frac{16}{9}$	2
	C	D	E	F	G	A		C^1

	$_{v}G$	$_{iv}G$	$_{iii}G$	$_{ii}G$	G	G_{ii}	G_{iii}	G_{iv}
)	1	$\frac{9}{8}$	$\frac{5}{4}$	$\frac{45}{32}$	$\frac{3}{2}$	$\frac{27}{16}$	$\frac{15}{8}$	2
	C	D	E	D_{iii}	G	A	B	C^1

	$_{vi}A$	$_{v}A$	$_{iv}A$	$_{iii}A$	$_{ii}A$	A	A_{ii}	A_{iii}
.)	$\frac{25}{24}$	$\frac{10}{9}$	$\frac{5}{4}$	$\frac{25}{18}$	$\frac{25}{16}$	$\frac{5}{3}$	$\frac{15}{8}$	$\frac{25}{12}$
	$_{iii}E$	D	E	D_{iii}	E_{iii}	A	B	E_{vi}

	$_{vii}B$	$_{vi}B$	$_{v}B$	$_{iv}B$	$_{iii}B$	$_{ii}B$	B	B_{ii}
)	$\frac{135}{128}$	$\frac{75}{64}$	$\frac{5}{4}$	$\frac{45}{32}$	$\frac{25}{16}$	$\frac{225}{128}$	$\frac{15}{8}$	$\frac{135}{64}$
	$_{ii}D$	$_{ii}E$	E	D_{iii}	E_{iii}	F_{iv}	B	D_{vii}

In order therefore to make an instrument which shall play in perfect tune in every one of these diatonic scales, we must have it capable of sounding the following notes, those of the original diatonic scale, or very near to them, being in parentheses, and requisite notes of nearly equal sound being written under one another.

$$(1)\ \begin{array}{c}\frac{25}{24}\\ \frac{135}{128}\end{array} \left(\begin{array}{c}\frac{9}{8}\\ \frac{10}{9}\end{array}\right) \frac{75}{64} \left(\begin{array}{c}\frac{5}{4}\\ \frac{81}{64}\end{array}\right) \left(\frac{4}{3}\right) \begin{array}{c}\frac{45}{32}\\ \frac{25}{18}\end{array} \left(\frac{3}{2}\right) \frac{25}{16} \left(\begin{array}{c}\frac{5}{3}\\ \frac{27}{16}\end{array}\right) \begin{array}{c}\frac{225}{128}\\ \frac{16}{9}\end{array} \left(\frac{15}{8}\right)\ (2)$$

With this we might go on ad infinitum; for it might be required to construct new diatonic scales on every one of these new notes, which would introduce more new notes, on which again new diatonic scales might be produced, and so on. But since the original scale consists only of major and minor tones (nearly equal) and diatonic semitones (nearly half-tones), the new notes will very nearly divide the whole tones into equal parts, a circumstance of which advantage will presently be taken. In the mean time we proceed to explain, as far as it can be done, the distinction musicians draw between *flats* and *sharps;* unfortunately we are unable to make writers on this subject agree with each other, or with themselves, as to the meaning of these words in an *untempered* scale. The conventions under which the names sharp and flat are used come easily enough, and temperament avowedly makes small adjustments and accommodations between the several notes, which cause the sharpened A to be practically the same as the flattened B, and so on. But what the clear and admitted distinction of sharp and flat is previously to that adjustment, we wish we could evoke or provoke some musician to tell us. One word to those who write on the scale without much mathematical knowledge;—get into a tempered scale as fast as you can, and keep there.

The nomenclature is regulated as follows. The notes A, B, C, D, E, F, G are preserved in every key; so that if any key contain A and a note between A and B, the latter is not called A♯, for then (A A♯) A would occur twice in the scale, but B♭, giving A B♭. Follow this rule in every one of the scales just given, and we shall find the following sets of notes in them severally:

								Name of the Key.
C	D	E	F	G	A	B	C^1	(natural, . . C)
D	E	F♯	G	A	B	C♯	D^1	(two sharps, D)
E	F♯	G♯	A	B	C♯	D♯	E^1	(four sharps, E)
F	G	A	B♭	C	D	E	F^1	(one flat, . . F)
G	A	B	C	D	E	F♯	G^1	(one sharp, . G)
A	B	C♯	D	E	F♯	G♯	A^1	(three sharps, A)
B	C♯	D♯	E	F♯	G♯	A♯	B^1	(five sharps, . B)

That is to say, a diatonic scale on D, for instance, only keeps D, E, G, A, B, or notes very near to them, of the diatonic scale, and requires the insertion of notes between F and G and C and D, which the avoidance of repetition of letters requires us to denote by F♯ and C♯, and not by G♭ or D♭. In the preceding keys then, we have five sharps mentioned (though really seven notes of the kind, two between C and D, two between F and G, one between each of D and E, G and A, A and B) and one flat (between A and B). Where are the other two sharps? If we construct diatonic scales upon F♯ and C♯ we shall find

F♯	G♯	A♯	B	C♯	D♯	E♯	F^1♯	(six sharps, . F♯)
C♯	D♯	E♯	F♯	G♯	A♯	B♯	C^1♯	(seven sharps, C♯)

with not precisely the same notes as before, but very near to them, excepting two notes which are new; one between E and G (called E♯) and one note between B and C (called B♯). But on which of the values of F♯ and C♯ in the table are these scales to be constructed, and why? Again, as to the flats, if we construct diatonic scales on B♭, and on each new flat as it is successively introduced, we shall find that our nomenclature gives us new keys, as follows:—

B♭	C	D	E♭	F	G	A	B♭	(two flats, . B♭)
E♭	F	G	A♭	B♭	C^1	D^1	E^1♭	(three flats, E♭)
A♭	B♭	C	D♭	E♭	F	G	A♭	(four flats, A♭)
D♭	E♭	F	G♭	A♭	B♭	C^1	D^1♭	(five flats, . D♭)
G♭	A♭	B♭	C♭	D^1♭	E^1♭	F^1	G^1♭	(six flats, . G♭)
C♭	D♭	E♭	F♭	G♭	A♭	B♭	C^1♭	(seven flats, C♭)

But if we were actually to proceed to form this scale, beginning from B♭ ($\frac{16}{9}$) gained from the preceding process, we should find ourselves keeping very near the chromatic scale of sharps already obtained, so that the notes which appear in the preceding as remnants of the diatonic scale would really be close to the real notes. Let us see, for instance, what the F would be in the key of G♭:

B♭, a fourth above F = $\frac{16}{9}$, E¹♭, a fourth above B♭ = $\frac{64}{27}$.
E♭ = $\frac{32}{27}$, A♭, a fourth above E♭ = $\frac{128}{81}$.
D¹♭, a fourth above E♭ = $\frac{512}{243}$, D♭ = $\frac{256}{243}$.
G♭, a fourth above D♭ = $\frac{1024}{729}$.
F¹ (so called) a seventh above G♭ = $\frac{1024}{729}$ × $\frac{15}{8}$ = $\frac{640}{243}$.
F (so called) = $\frac{320}{243}$, F (really) = $\frac{4}{3}$.

Now from $\frac{320}{243}$ to $\frac{4}{3}$ the interval is only $\frac{81}{80}$, the comma, which we meet with so often elsewhere. But we should find different values for the same flat in the different keys above, just as we have found different values for the same sharp in the preceding. To show however in how confused a state the natural chromatic scale has been left, we copy three scales, the first from Wallis ('Phil. Trans.,' No. 242, A.D. 1698), the second from La Borde ('Essai sur la Musique ancienne et moderne,' vol. ii. p. 9, A.D. 1780), and the third from Montferrier ('Dict. des Math.,' vol. iii. p. 243, A.D. 1840). All these writers *omit the flats*, mentioning only the sharps:—

C	C♯	D	D♯	E	F	F♯	G	G♯	A	A♯	B
1	$\frac{18}{17}$	$\frac{9}{8}$	$\frac{19}{16}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{24}{17}$	$\frac{3}{2}$	$\frac{30}{19}$	$\frac{5}{3}$	$\frac{30}{17}$	$\frac{15}{8}$
1	$\frac{25}{24}$	$\frac{9}{8}$	$\frac{75}{64}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{45}{32}$	$\frac{3}{2}$	$\frac{25}{16}$	$\frac{5}{3}$	$\frac{225}{128}$	$\frac{15}{8}$
1	$\frac{16}{15}$	$\frac{9}{8}$	$\frac{6}{5}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{45}{32}$	$\frac{3}{2}$	$\frac{8}{5}$	$\frac{5}{3}$	$\frac{16}{9}$	$\frac{15}{8}$

It has been laid down by some writers that the definition of a sharp and flat is as follows: when it is necessary to take a note between, say A and B, that note is called A♯ when it is nearer to A, and B♭ when it is nearer to B. Let such be the definition; then the note which is exactly half way between C and D, being expressed by $\sqrt{(9:8)}$, is 1·0607, while $\frac{18}{17}$, $\frac{25}{24}$, and $\frac{16}{15}$ are severally 1·0588, 1·0417, and 1·0667. The two first only come under the denomination of C♯, according to this definition, while the third ought to be called D♭. In fact, this third scale is almost a scale with its semitones, collected from the minor keys which are found to please the ear, with a slight alteration and one addition. In (2) B♭ is made as a fourth to F, instead of a fifth to E♭ (giving $\frac{16}{9}$ in place of $\frac{9}{5}$, the interval of the two being only a comma); let $\frac{9}{5}$ be taken instead of $\frac{16}{9}$. Then between F and G insert G♭, a minor third to E♭ (giving $\frac{36}{25}$). Take the simplest sharps from the diatonic scales hereinbefore found, and, putting all the results together, we shall have the following, which, if a complete untempered ENHARMONIC scale is to be given, will, we believe, be as defensible as any. The sharps are all derived from the diatonic major scale, the flats from minor scales made by the usual minor intervals; the sharp of each note is lower than the flat of the following, though the former and the latter are not always in different halves of the interval:—

C	C♯	D♭	D	D♯	E♭	E	F	F♯	G♭	G	G♯	A♭	A	A♯	B♭	B	C
1	$\frac{25}{24}$	$\frac{16}{15}$	$\frac{9}{8}$	$\frac{75}{64}$	$\frac{6}{5}$	$\frac{5}{4}$	$\frac{4}{3}$	$\frac{45}{32}$	$\frac{36}{25}$	$\frac{3}{2}$	$\frac{25}{16}$	$\frac{8}{5}$	$\frac{5}{3}$	$\frac{225}{128}$	$\frac{9}{5}$	$\frac{15}{8}$	2

The enharmonic intervals of this scale are as follows:—

C♯ D♭ = 1·024, D♯ E♭ = 1·024, F♯ G♭ = 1·024,
G♯ A♭ = 1·024, A♯ B♭ = 1·024:

so that this enharmonic interval will be in every instance $\frac{128}{125}$, or 1·024. This circumstance was not looked for in the formation of the scale, and it is thus seen that if the sharps be derived from the major diatonic scales of the different notes in the fundamental diatonic scale, and the flats solely from the minor scales which have been judged admissible, the result is an enharmonic scale, in which the enharmonic interval is everywhere the same, namely, the interval by which three major thirds fall short of an octave.

If an instrument could give all the above sounds, the same music played in different keys would have slightly different effects. We remember to have seen a statement of the supposed character of the different keys, which would be useless here, on account of its not describing the scale which was supposed to be the basis. We might suppose beforehand that of two keys, the one in which some prominent consonances are a little flatter than in the other, would partake, in a slight degree more than the other, of the plaintive character which distinguishes the minor keys. But, in the first place, instruments in general, and particularly the piano-forte, on whi
first comes into existence, ha
between each note of the diatonic scale,
must serve both to sharpen the lower,
higher. Next, the preceding scale would be
tolerable in some keys, particularly if
organ. Some TEMPERAMENT, that
tion of notes to each other, would be
we defer to a separate article the
which prevail, or have been proposed.
here to lay the mathematical fou
which is easy enough to one who can
following table will be necessary.
explain:—

1	00·00	51	68·07	101	79·90	151			
2	12·00	52	68·40	102	80·07	152			
3	19·02	53	68·73	103	80·24	153			
4	24·00	54	69·06	104	80·40	154			
5	27·86	55	69·38	105	80·57	155			
6	31·02	56	69·69	106	80·73	156			
7	33·69	57	70·00	107	80·90	157			
8	36·00	58	70·30	108	81·06	158			
9	38·04	59	70·59	109	81·22				
10	39·86	60	70·88	110	81·38				
11	41·51	61	71·17	111	81·53				
12	43·02	62	71·45	112	81·69				
13	44·40	63	71·73	113	81·84				
14	45·69	64	72·00	114	82·00				
15	46·88	65	72·27	115	82·16				
16	48·00	66	72·53	116	82·30				
17	49·05	67	72·79	117	82·44				
18	50·04	68	73·05	118	82·59				
19	50·98	69	73·30	119	82·74				
20	51·86	70	73·55	120	82·88				
21	52·71	71	73·80	121	83·02				
22	53·51	72	74·04	122	93·17				
23	54·28	73	74·27	123	83·31				
24	55·02	74	74·51	124	83·45				
25	55·73	75	74·74	125	83·59				
26	56·40	76	74·98	126	83·73				
27	57·06	77	75·20	127	83·86	177			
28	57·69	78	75·42	128	84·00	178			
29	58·30	79	75·65	129	84·14	179			
30	58·88	80	75·86	130	84·27	180			
31	59·45	81	76·08	131	84·40	181			
32	60·00	82	76·29	132	84·53	182	90		
33	60·53	83	76·50	133	84·67	183	90		
34	61·05	84	76·71	134	84·79	184			
35	61·55	85	76·91	135	84·92	185			
36	62·04	86	77·12	136	85·05	186			
37	62·51	87	77·32	137	85·18	187			
38	62·98	88	77·51	138	85·30	188			
39	63·42	89	77·71	139	85·43	189			
40	63·86	90	77·90	140	85·55	190			
41	64·29	91	78·09	141	85·68	191	[illegible]		
42	64·71	92	78·28	142	85·80	192	91		
43	65·12	93	78·47	143	85·92	193	91		
44	65·51	94	78·66	144	86·04	194	91		
45	65·90	95	78·84	145	86·16	195	91		
46	66·28	96	79·02	146	86·28	196	91		
47	66·66	97	79·20	147	86·40	197	91		
48	67·02	98	79·38	148	86·51	198	91·55		
49	67·38	99	79·55	149	86·63	199	91·64		
50	67·73	100	79·73	150	86·74	200	91·73		

Since all intervals are found by multiplic
it is obvious that if for intervals we substitu
of intervals, we form logarithms of new inter
and subtraction. Hitherto, we express a note
a vibrations while the fundamental note makes
by $\frac{a}{b}$; let us now express it by log *a*—log *b*, the
of the preceding. It only remains to see what
logarithms it will be most convenient to take. Hav
the octave, or the interval from 1 to 2, consist
semitones (not equal indeed, but nearly so),
new scale, to which all others shall be referr
divides the octave into 12 *equal* semitones.
pered scale, on the (theoretically) simplest sy
perament, and it is agreeable enough to the
Let 1 be made the logarithm of the interval
these mean semitones, then 12 is
interval of an octave, or we must
logarithms in which log 2 = 12. The pre
table; to the mathematician it would be de
the base of which is $\sqrt[12]{2}$. But to the mus
described as follows: it shows the number
tones contained in every HARMONIC of the
note, from the first to the 250th inclusive.
to 21 we see written 52·71, which means that
of a string sounds a note which is 52
·71 or $\frac{71}{100}$ of a mean semitone above the
note of the string. This interval ·71 of a
is one which, repeated a hundred ti
tones. All the numbers of the ta

e approximate, within the hundredth of a semitone or reabouts; which is more than exact enough for practical poses. The following rule is all that is necessary:—If a e make $\frac{a}{b}$ vibrations while the fundamental note makes hen that note is log a − log b mean semitones above, or b − log a mean semitones below, the fundamental note, rding as a is greater than b, or b greater than a.

xample 1. What is the value of a comma in mean itones? Log 81 − log 80 is 76·08 − 75·86 = ·22, and answer is, that the comma is 22-hundredths, or someg less than a quarter, of a mean semitone. Raising te by a comma four times successively would not raise uite a semitone.

xample 2. What is the enharmonic interval above obed. in mean semitones? Log 128 − log 125 = 84·00 3·59 = ·41, or about four-tenths of a mean semitone.

s shows that an untempered enharmonic scale, such as proposed, if bearable when the sharps and flats are incidental deviations, would never do for any other key ept the natural one.

he following is the complete basis above given, of the armonic scale, with all the intervals, measured from the damental note, expressed in mean semitones; it shows much alteration a system of mean temperament would uire: it being remembered that although some few ruments have been made which give more than twelve erent notes in the octave, this is so unusual a circumce that it is not worth while to dwell upon it:—

	1	00·00		G♭	$\frac{36}{25}$	6·31	·41
♯	$\frac{25}{24}$	00·71	·71	G	$\frac{3}{2}$	7·02	·71
♭	$\frac{16}{15}$	1·12	·41	G♯	$\frac{25}{16}$	7·73	·71
	$\frac{9}{8}$	2·04	·92	A♭	$\frac{8}{5}$	8·14	·41
♯	$\frac{75}{64}$	2·74	·70	A	$\frac{5}{3}$	8·84	·70
♭	$\frac{6}{5}$	3·16	·42	A♯	$\frac{225}{128}$	9·76	·92
	$\frac{5}{4}$	3·86	·70	B♭	$\frac{9}{5}$	10·18	·42
	$\frac{4}{3}$	4·98	1·12	B	$\frac{15}{8}$	10·88	·70
♯	$\frac{45}{32}$	5·90	·92	C	2	12·00	1·12

he first column gives the name of the note; the second, ratio of its number of vibrations per second to those of fundamental note; the third, the interval from the lamental note in mean semitones; the fourth, the inal between each consecutive pair of notes. The small ations observable in the last column arise from imperion of the table (every table must be imperfect in its figures); and we see four intervals in it, namely the diatonic semitone 1·12, the *major* and *minor chromatic tones* (as we will call them) ·92 and ·72, and the enmonic interval (or enharmonic *diesis*, as it is called) . And the major tone is in every instance

maj. chrom. semit. + min. do. + enh. int.

le the minor tone is

2 min. semit. + enh. int.

f we confound the major and minor tone (and to disuish them is the *ultima Thule* of temperament), we t take a mean value, and substitute it both for the or and minor chromatic semitone. The mean tone is , which is to the diatonic semitone nearly as 5 to 3. The n chromatic semitone is ·81, about $\frac{2}{3}$ of the diatonic itone, and the enharmonic interval is its half. This is ell-known system of temperament (that of Huyghens): octave being divided into 31 equal parts, five of them a tone, three a diatonic semitone, two a chromatic sene, and one the enharmonic interval. Introduce E♯ C♭, which are omitted in the preceding, and we have following for a tempered enharmonic scale, upon which doubt of any improvement being practicable, without mpting the distinction between a major and minor tone:

C♯ D♭ D D♯ E♭ E F♭ E♯ F F♯ G♭ G G♯
2 1 2 2 1 2 1 1 1 2 1 2 2 1

A♭ A A♯ B♭ B C♭ B♯ C
2 2 1 2 1 1 1

s system however is useless, inasmuch as instruments required to have only twelve notes in the octave; but should recommend the student to bear it in mind, as laining those enharmonic changes which in piano-forte music are only fictions. This scale would enable us to play with equal correctness in all keys up to seven flats among the flats, and seven sharps among the sharps. Naming these keys by their principal notes, they are the keys of

C G D A E B F♯ C♯
F B♭ E♭ A♭ D♭ G♭ C♭

Suppose now there is an incidental deviation into the key of A♯. Looking into the preceding scale from A♯ ascending, we find we can get a whole tone at B♯, but the next whole tone is wanting, nor can we get it except by interposing a note between D♭ and D, two tempered chromatic semitones above C, and therefore called C♯♯ or C×. On the piano-forte we must be content with D for C♯♯, and according we have in like manner

E for D♯♯, D for E♭♭, D♯ for F♭♭, &c.

In the preceding scale also, when enharmonic transitions are written, they can most frequently be actually made; on the piano-forte, though written, they can only be made in imagination. The ear, knowing what is coming, as soon as the enharmonic modulation is *seen*, prepares itself for a change of key, and gives the chord in its possession to the mind, not altogether in the same way as when it was not a note of preparation. If any one will compare the effect of music heard the second time with that produced by the first time, he will, we think, be inclined to accede to our opinion, that sounds heard without any knowledge of what is to come afterwards differ more than those which are heard with such knowledge than the effects of two scales constructed on the two most remote of all the approved systems of temperament. In Huyghens's system, his subdivision is ·387 of a mean semitone, the chromatic semitone is ·774, the diatonic semitone 1·161, and the tone 1·935.

The harmonics of any string C may be readily found from the table, reduced into the octave between C and C^1 they may then be compared with the untempered diatonic scale. For example, what is the 53rd harmonic of C? C itself, counting as the first. It is by the table 68·73 mean semitones above C, lower this five octaves, by subtracting 60, and we have 8·73, lying therefore between A♭ and A, but nearer to the latter.

[Chromatic Scale; Diatonic; Enharmonic. For Scales of Voices, Alto, Base, &c. For Scales of Musical Instruments, Bassoon, Clarinet, Harp, Violin, &c.]

SCALE (Mathematics). A scale is any line drawn upon wood or other solid substance, and divided into parts, equal or unequal, the lengths of which may be taken off by the compasses, and transferred to paper, in aid of any geometrical construction. The manner in which the scale is divided depends of course upon the nature of the algebraical or trigonometrical expression the values of which are to be represented. When the subdivisions of a scale are equal, any of the methods noticed in Graduation may be employed to obtain them; but in other cases, and indeed in the preceding one, it is usual to form scales by copying from an original which is carefully made in the first instance.

The most simple of all scales is that in which the subdivisions are all equal, or, as it is called, a scale of equal parts. Such a scale is not only the most easily constructed, but may be considered as containing all other scales. For example, suppose it required to lay down very accurately an angle of 25 degrees. It appears [Chord] that if the radius contain 500 equal parts, the chord of 25° contains 216 such parts and four-tenths of a part. With a good scale of equal parts, and five hundred of them taken as a radius, the angle may be laid down, if required, much more correctly than by a common scale of chords. [Protractor.] The largest table of chords which is laid down on common scales has a radius of three inches, the five hundredth part of which, or about the 167th of an inch, is a very small length, and it is difficult to trust any scale so far without verification, except the scale of equal parts. In the latter species, one part may be tried against another, and any one may for himself very soon ascertain whether there is any perceptible error. In all the most accurate species of drawing, it is better to rely on tables and a really good scale of equal parts than on any of the common scales, though the latter are generally very good, and will do abundantly well for ordinary purposes.

Long scales of equal parts are made with different subdivisions, ranging from the thirtieth part of an inch to the fiftieth. If the substance of the scale be ivory, an inch will very well bear division into sixty parts, but fifty is more convenient for decimal calculation. A common ivory scale, of a rectangular form, such as is usually found in cases of drawing-instruments, if it have no trigonometrical lines laid down, usually contains the following scales of equal parts:—

1. The quarter of an inch divided into ten equal parts, each of which is again subdivided into ten equal parts by a Diagonal Scale. There are commonly two diagonal scales, one at each end of the scale of quarters, the one on the left dividing the eighth of an inch into 100 parts, and the one on the right the quarter. It will easily be seen that the 400th of an inch is a uselessly small quantity, even when the lines are drawn on ivory.

2. A set of scales in which the inch is severally divided into 30, 35, 40, 45, 50, and 60 equal parts. Ten of these parts make, in each case, one of the larger subdivisions of the scale, and one larger division is also divided into twelve equal parts, so that, when the larger division is made to represent a foot, feet and inches may be easily laid down.

3. A set of scales in which the larger divisions are [illegible] and [illegible] of an inch. The larger division is, as before, divided both into ten and twelve parts.

When trigonometrical lines are laid down, they are usually one or two scales of *chords*, the radius of each of which is found by its chord of sixty degrees; a scale of *rumbs*, which is nothing more than a scale of chords, the angular unit being, not a degree, but a point of the compass; a scale of sines, with one of secants sometimes added; a scale of tangents, and of semitangents, the latter being really the same scale as the former, but marked with double angles, semitangent being a technical term, not for the half of an angle, but for the tangent of half an angle. We shall have something more to say of these lines under Sector. In Gunter's scale, as it is called, which is a scale of two feet in length, used in navigation, there are also scales of logarithms, of numbers, sines, tangents, &c., and also a scale of meridional parts [Rumb Line]; of these logarithmic scales we shall have to speak more particularly under Sliding Rule.

SCALENE, a name given by Euclid, in his definitions (but seldom or never afterwards used by him), to a triangle no two sides of which are equal to one another.

SCALIGER, JULIUS CÆSAR, was born, according to the statement of his son, on the 23rd of April, 1484, in the castle of Riva near the Lago di Garda. The history of the descent and the early youth of Scaliger is involved in inextricable difficulties, as he himself at one period of his life made pretensions, which, though supported by his son, are irreconcilable with other well-attested facts, and which were contradicted and ridiculed in his own lifetime by eminent contemporaries. His real name was Della Scala, and he pretended to be descended from the princely family of the Scalas of Verona. There is a patent of naturalization which, in 1528, he requested and obtained from Francis I., king of France, in which he is called 'Julius Cæsar della Scala de Bordone, doctor of physic, a native of Verona in Italy.' This document, which would surely have mentioned his noble descent, if it had been known, shows either that his pretensions were without any foundation, or at least that he did not indulge in this vanity till at a more advanced period of life. Tiraboschi calls him the son of Benedetto Bordone, a native of Padua, who lived at Venice, carried on the trade of illuminator, and assumed the name of Scaliger, either because he had a scale for his sign or because he lived in a street called Scala. According to Scaliger's own account, he had in his twelfth year been made a page to the emperor Maximilian, whom he served for seventeen years, both in peace and war. Afterwards he retired to Ferrara, where he received a pension from the duke of Ferrara. His parents had died in the mean time, and he now determined to abandon his military pursuits and to apply himself to study. He therefore went to Bologna with the intention of studying theology and of entering into the Franciscan order. But he soon gave up his theological studies, returned to the military profession, and served for some time in Piedmont under the French viceroy. At Turin he was persuaded by a physician to begin the study of physic, which he did in his leisure hours and without leaving the army. About this time he also commenced learning Greek, of which he had hitherto been entirely ignorant. As he advanced, his delight in his new studies increased, and this, as well as frequent attacks of the gout, at length induced him t[illegible] and to devote himself entirely to h[illegible] 1525 he accompanied Antonio de la [illegible] made bishop of Agen, to his new di[illegible] physician. The degree of doctor of [illegible] tioned in the document above referre[illegible] obtained before this time, but in what [illegible] tain, though it is generally supposed [illegible] Padua. It was at first his intention [illegible] but soon after his arrival there he fell [illegible] de Rogues, a young lady of a noble [illegible] whom he married. He now settled at [illegible] until his death, on the 21st of Octo[illegible] tinued the practice of physic, and [illegible] secuted his scientific and lite[illegible]

Considering that Scaliger [illegible] advanced a period of life, and [illegible] well as the value of his works, no [illegible] of [illegible] before he had attained the [illegible] fo[illegible] owned that he was one of th[illegible] the age. He had a most ten[illegible] understanding. His son pr[illegible] great love of truth, but he was [illegible] a ver[illegible] ment and excessively vain; and [illegible] or antagonist with the utmost co[illegible] provoked many bitter enemies, [illegible] his contemporaries, and scholars [illegible] bestowed on him the most extra[illegible] Lipsius, Casaubon, Vossius, Hu[illegible] as a scholar, though very great in [illegible] more just appreciation of subsequen[illegible] by that of his son Joseph.

The following is a list of his principal works:—'Commentarii in Hippocratis librum De Insomniis,' Gr. et Lat., Lyon, 1538, 8vo. 'De Causis Linguæ Latinæ Libri xviii.,' Lyon, 1540, 4to., reprinted at Geneva in 1580. This is the first great work which was written on the Latin language in modern times, and it is still valuable, though it contains a great many fanciful subtleties. 'Exercitationum Exotericarum Liber Quintus-decimus de Subtilitate ad Hieronymum Cardanum,' Paris, 1557, 4to. The fourteen preceding books, which had no relation to Cardanus, have never been published. 'Poetices Libri Septem,' Lyon, 1561, fol. This work perhaps contributed most to the reputation of the author, though it shows that he possessed more grammatical knowledge than profound critical or creative powers. 'In Theophrasti Libros Sex de Causis Plantarum Commentarii,' Geneva, 1566, fol.; 'Commentarii in Aristoteli adscriptos Libros Duos de Plantis,' Geneva, 1566; 'Aristotelis Historiæ Animalium Liber Decimus, cum vers. et comment.,' Lyon, 1584, 8vo.; 'Animadversiones in Theophrasti Historias Plantarum,' Lyon, 1584, 8vo.; 'J. C. Scaligeri adv. Desid. Erasmum Orationes Duæ, Eloquentiæ Romanæ Vindices, cum ejusdem Epistolis et Opusculis,' Toulouse, 1621, 4to. The first of these orations, which were directed against the work of Erasmus, entitled 'Ciceronianus, sive de optimo Dicendi Genere,' was published at Paris in 1531, and appears to have been his earliest work. Scaliger also published a number of Latin poems, which however are of very little value. The style is often obscure and bombastic.

SCALIGER, JOSEPH JUSTUS, the son of Julius Cæsar Scaliger, was born on the 4th of August, 1540, at Agen. He received his earliest instruction from his father. At the age of eleven he was sent with two of his brothers to the college of Bordeaux, where he applied himself chiefly to the study of the Latin language. After a stay of three years at Bordeaux, he was compelled by the appearance of the plague to quit the place and return to Agen. His father now continued his education, and made him write every day a Latin essay on some historical subject, by which exercise the youth became most intimately acquainted with the Latin language. His father sometimes also made him transcribe some of his own poetical compositions, which seems to have inspired the youth with such a love of poetry, that at the age of sixteen he attempted to write a tragedy on the story of King Œdipus. After the death of his father, when he was nineteen years of age, he went to Paris, where he devoted himself principally to the study of Greek. At first he attended the lectures of A[illegible] nus Turnebus, but when he found [illegible] he [illegible] more rapid progress by private study [illegible] to his room and began reading the [illegible] self. He commenced with Homer, and in the course of two years which he spent in his seclusion from the world he read nearly all the Greek authors both in verse and prose. He also turned his attention to Oriental languages, which he likewise learned by himself.

Respecting the years which succeeded this period of intense study, from about 1565 till 1593, we know very little of the life of Scaliger. It must have been during this time that he left the church of Rome and became a Protestant, which was probably the reason why he did not obtain any public appointment in France. In the year 1593 he was invited to the chair of belles-lettres in the university of Leyden, where he spent the remainder of his life, devoting himself entirely to the elucidation of antiquity. He was one of that constellation of great scholars who are to this day remembered as the ornaments of the university of Leyden. Among his numerous pupils was Hugo Grotius, who enjoyed the especial friendship of Scaliger, and who was entirely guided by him in his studies. Scaliger's life in Holland presents scarcely any incidents, and we only know that, absorbed in his studies, he paid so little attention to matters of ordinary life, that he spent many days in his study without thinking of taking any food, and that he was sometimes in a state of absolute poverty. Several persons of distinction, who esteemed his talents and his learning, generously offered to extricate him from his difficulties, but his pride never allowed him to accept any present. He was never married. He seems to have inherited his father's character, for he was exceedingly proud, and, like his father, he treated his literary opponents with the most perfect contempt. He revived and defended the idle pretensions of his father respecting the illustrious origin of his family, in a letter addressed to Dausa, 'De Vetustate et Splendore Gentis Scaligeranæ.' This letter was directed against Scioppius, and was full of the bitterest invectives against that scholar. Scaliger died of dropsy, on the 21st of January, 1609.

As a critic Joseph Scaliger is pre-eminent, and there are very few scholars who can be compared with him. Some of his works even now excite our astonishment and admiration by the prodigious learning which they display, combined with an almost unparalleled acuteness and sagacity. Although in his verbal criticism and in his emendations and conjectures he is often too bold and too capricious, yet all that he has done bears the peculiar impress of his great genius, and he scarcely ever exposes himself to the charge of inaccuracy, from which his father was by no means free.

The greatest among the numerous works of Joseph Scaliger is, 'De Emendatione Temporum,' Paris, 1583, fol. A corrected and much improved edition of this work appeared at Geneva, 1629, fol. In this work Scaliger, for the first time, explained the Julian period in a satisfactory manner, and established a complete system of chronology founded on sound principles. Several errors which were detected in the work by his contemporaries, were afterwards corrected by Scaliger himself, in another work, entitled 'Thesaurus Temporum, complectens Eusebii Pamphili Chronicon cum Isagogicis Chronologiæ Canonibus,' the best edition of which is that published at Amsterdam, 1658, in 2 vols. fol. Among his other and less important works there is a Latin translation of two centuries of Arabian proverbs, published at Leyden, 1623; his 'Poemata,' Leyden, 1615, 8vo.; and his 'Epistolæ,' which were edited by Daniel Heinsius, at Leyden, 1637, 8vo. His poems have little merit, but his Epistles are very instructive, and also valuable for the literary history of his time. Scaliger also edited many antient authors with emendations and annotations, and there are few antient writers for whom he has not done something. His commentary on Varro 'De Lingua Latina' was written when he was twenty years of age; it was published at Paris, 1565, and is reprinted in the Bipont edition of Varro. His edition of Theocritus, 'Cum Emendat. Jos. Scalig. et Is. Casaub. Lect.,' appeared at Heidelberg, 1596, 8vo.; 'M. Manilii Astronomicon,' Leyden, 1600, 4to; Catullus, Tibullus, and Propertius, Paris, 1577, 8vo. He also made emendations and wrote commentaries on Seneca the dramatist, Ausonius, Nonnus, Festus, and many other authors.

SCALOPS. [Sorecidæ.]

SCALPELLUM. [Cirripeda, vol. vii., p. 208.]

SCAMANDER. [Troad.]

SCAMMONY. [Convolvulus.]

SCAMOZZI, VINCENZIO, was both a contemporary and fellow-countryman of Palladio, having been born in 1552 at Vicenza, where his father Giovanni Domenico also practised as an architect. He was taught by his father the elementary part of his art, and then sent by him to Venice, where he is said to have studied under Palladio, yet this is exceedingly doubtful, and it is certain that in his writings Scamozzi is rather a detractor than an admirer of that master. Before leaving Vicenza he had given proofs of his abilities and taste in several designs for Count Verlati and others; and in 1569 he was employed to remedy the defects of S. Salvatore at Venice (destroyed by fire, 1741). At the age of twenty-two he wrote a treatise on perspective, wherein he entered at length into the subject of scene-painting. It was in 1579 that he first visited Rome, where the sight of the remains of antiquity filled him with admiration. He was most diligent in studying them, sparing neither expense nor personal trouble; and among other things of the kind he made elaborate drawings of the baths of Antoninus and of Diocletian. Having thus occupied himself in that city for eighteen months, he proceeded to Naples, at which place and its environs he was equally diligent in exploring the vestiges of antient buildings.

On his return home he resolved to fix himself at Venice, as offering a wider field to his ambition. His first occupation there was however with his pen, for, at the request of a bookseller, he wrote the explanations to a series of plates by Pittori, to which he prefixed three chapters relative to antient Rome generally, a work which, although extolled by Maffei beyond its real merits, not undeservedly obtained for him credit with his contemporaries as one of the most erudite in his profession. The recent deaths of Sansovino and Palladio (1570 and 1580) were circumstances in his favour, and caused him to be generally looked forward to as their successor in the public esteem. Accordingly almost his very first work, after the monument to the Doge Niccolo da Ponte, was to complete the public library by the first-mentioned of those architects; he was afterwards similarly employed to finish one of Palladio's, namely, the Teatro Olimpico at Vicenza, to which he added the fixed scena, with its three avenues of buildings shown in perspective, but executed in relief. Although such kind of decoration is utterly unsuitable to the modern drama, and is anything but an improvement on painted scenery, it gave such satisfaction, that in 1588 he was employed by the Duke Vespasiano Gonzaga to erect a similar theatre at Sabbionetta, of which structure nothing now remains.

About this time a deputation being sent from the republic to congratulate Sigismund on his accession to the throne of Poland, Scamozzi availed himself of the opportunity offered him by his friend the senator Duodo of visiting that country, and also in the course of their route some of the principal cities of Germany. It was this journey that first suggested what continued to be afterwards a favourite object of his, namely, the work entitled 'Architettura Universale,' which he intended to be a sort of encyclopædia of the art, and to contain specimens of various styles and examples in different parts of Europe. Nor was this the only result of his journey, for on passing through Salzburg he was introduced to the archbishop, by whom he was afterwards employed (1604) to design the cathedral of that city, which may be considered as his work, though not completed till 1628, and which is described by Temanza as one of the noblest temples of modern times, and greatly superior, as regards architecture alone, to St. Peter's. In the meanwhile his engagements at home were numerous, and, besides many noble private habitations erected by him both in the city and on the Venetian terra firma, he built several churches, among others that of S. Nicolo di Tolentino, Venice (remarkable for having a Corinthian hexastyle diprostyle, subsequently added by Tirali), and SS. Simone e Giuda. But his most important work, that which has chiefly contributed to his fame, is the stately range of building on the south side of St. Mark's Place, called the Procuratie Nuove, commenced by him in 1586. The design itself however may be said to belong nearly as much to Sansovino, at least to have been fixed by him, all the lower part as far as the entablature of the second order being in continuation of the façade of the adjoining public library; while the difference is that the excessively deep frieze and cornice of Sansovino's second order are moderated, and a third or Corinthian story added to the elevation. This last order has been considered by some to be the most elegant portion of the whole, but it is also objected to as destroying the general uniformity, in regard to height, of the buildings on three of the sides of the piazza. Scamozzi was almost overwhelmed with commissions and applications for designs. Among his other works are—the Palazzo Roberto Strozzi, Florence; the Palazzo Pretorio, Vicenza; ditto Bergamo; the Villa Duodo, and seven small churches or chapels at Monselice. He also made two designs for the Rialto bridge, one with three arches, the other with a single arch, but neither was adopted. Thus continually engaged, he had little leisure for his pen, and did not therefore complete his 'Architettura Universale,' which was to have been in ten books, but only six appeared, and those were published only a few months before his death, on August 7th, 1616; two days before which he made a singular will, expressive of a most extraordinary solicitude for perpetuating his name, for having no surviving offspring, he there adopted Francesco Gregori, who died shortly after, and protracted litigation as to his successor under the will was the consequence. What renders such solicitude on the part of Scamozzi an inconsistency is that he speaks of himself as having acquired an imperishable name.

SCANDAL (*scandalum magnatum*, slander of great men). By the statute 2 R. II., c. 5, confirmed 12 R. II., c. 11, as to 'devisers of false news and tellers of horrible and false lies of prelates, &c.'), it was enacted that none devise or speak false news, lies, or other such false things of the prelates, nobles, and great men of the realm. By the same statute the tellers of such lies were liable, as by the statute of Westminster the first, to be imprisoned till they discovered the authors of them. No statutory punishment was provided against the authors, perhaps because they were liable at common law to fine and imprisonment. Upon this statute is founded the action of scandalum magnatum, which is now fallen into disuse, and superseded by the common action of libel and by the criminal information. It lies at the suit of any nobleman, though of a dignity created since the date of the statute, of the judges, and of other great officers of the realm. It has been held that the action may be brought not only for such words as are actionable in ordinary cases, but even for those which are not certain enough to maintain an action against a common person, as where one said, 'My lord has no more conscience than a dog.'

The object of the statute originally, though afterwards it appears to have been applied in private cases, was wholly of a political character. The mischief recited is that 'debates and discords might arise betwixt the said lords, or between the lords and the commons, which God forbid, whereof great peril and mischief might come to all the realm, and quick subversion and destruction of the aforesaid realm.' The statute of Westminster, 3 Edw., c. 33, referred to, is also directed to cure the same mischiefs, the discord and scandal that might arise between the king and his people, or the great men of the realm.

The term *scandalous* is applied to matter in a Bill or Answer in Equity which reflects on the character of a defendant or plaintiff, and is at the same time irrelevant. Such matter will be struck out on exceptions being taken to it and allowed.

(2 *Inst.*, 225; Com., *Dig.*, tit. 'Action on the case for Defamation:' B., *Libel*, C. 5.)

SCANDER-BEG, prince of Albania, whose real name was George Castriota, was the son of John Castriota, one of the rulers of that country. He was born in 1404. His father having become a tributary to the Turks, Scander-beg, with three other brothers, was sent to the court of Murád II., who lodged them in his own palace, and had them educated in the Mohammedan religion, notwithstanding the solemn promise to the contrary given to their father. After the death of his three brothers, Scander-beg rose in favour with that sultan, who received him into his guard, promoted him, and gave him the appointment of Sanjac-beg, with the command of five thousand cavalry. On the death of his father in 1432, his family dominions were seized by Murád, who appointed a bashaw to govern them in his own name.
From that time Scander-beg formed the design
himself of his principality. Having accom
Turkish army to Hungary, he entered into a se
ment with the celebrated Hunyade, waywode of T
and commander-in-chief of the combined Chri
and he contributed, by a sudden manœuvre o
under his command, to the defeat of the Turk
the plain of Nissa (10th November, 1443). Ha
confusion resulting from the battle, penetrated int
the Reis Effendi, he put him to death with hi
after compelling him to sign an order to the Turk
of Epirus, enjoining him to deliver Croia, the
the surrounding districts to the bearer. Scan
the camp with three hundred Albanians, app
Croia, massacred the Turkish garrison, and a
throne of his fathers, having previously renoun
hammedan religion. A long warfare ensued: b
frequently obliged to retire to the fastness of the
Scander-beg renewed his attacks upon the firs
occasion, and in this manner destroyed a vast n
enemies. In 1444 he defeated in the Lower D
derable force which had been sent against him:
in 1449 Murád took from him the importan
Sfetigrad, though he invested Croia in 1450, t
sultan was at last compelled to raise the sieg
into his own dominions, where he died (at Adr
February, 1451. Mohammed II., who was
cessor, having proposed to Scander-beg term
which were accepted, that warrior, at the requ
Pius II., repaired to Italy, to the assistance of
king of Naples, who was closely besieged at B
count of Anjou. Not only did Scander-beg
prince to raise the siege, but he greatly contr
victory which Ferdinand gained over his ant
Troia (18th August, 1462). The Venetians
clared war against the Turks, Scander-beg
by them to break the treaty by which he was b
make an inroad into Mohammed's dominion
again successful, and defeated a considerable f
sieged Croia, the capital of his states. He w
carried off by sickness at Lissa in the Venetian
the 17th January, 1467, in the 63rd year of his
a son of tender years, whose guardianship he
the republic of Venice. His death however
lowed by the entire submission of Albania to
yoke. [ALBANIA.] Scander-beg was a great
enterprise and military skill constituted him
ablest generals of his day. Such were his pers
and his courage in the field, that the Turks
surname of Iskander-beg (Prince Alexande
taking of Lissa, where his remains were dis
conquerors, the Turks dug up his bones and m
amulets, under the impression that they would
his courage to them. There are various chron
der-beg: the principal and the best is that of
lesio, his contemporary, which appeared for th
Frankfort, 1537, folio, under the title of 'De
bus ac Rebus præcipuè adversus Turcas
Castrioti clarissimi Epirotarum Principis, qui
berrima facinora Scanderbegus, hoc est Alexa
cognominatus fuit.' It was afterwards reprin
lated into French and German. Another a
tory had previously appeared at Rome in 153
Monardo published one in Italian (Venice, 159
was translated into Portuguese and into Spa
are also 'Histoire de Scander-beg,' by Du
1709; 'Scander-beg, ou les Aventures du Prin
by Chevilly, ibid., 1732, 2 vols. 12mo.; and tw
on the history of Scander-beg, one by Kökert
4to.), the other by Busieres.

(Hammer Purgstall, *Geschichte des Osmani*
Pesth, 1827-35, vol. ii.; Hawkins's *History of*
Empire, London, 1787, vol. i.)

END OF VOLUME THE TWENTIETH.

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